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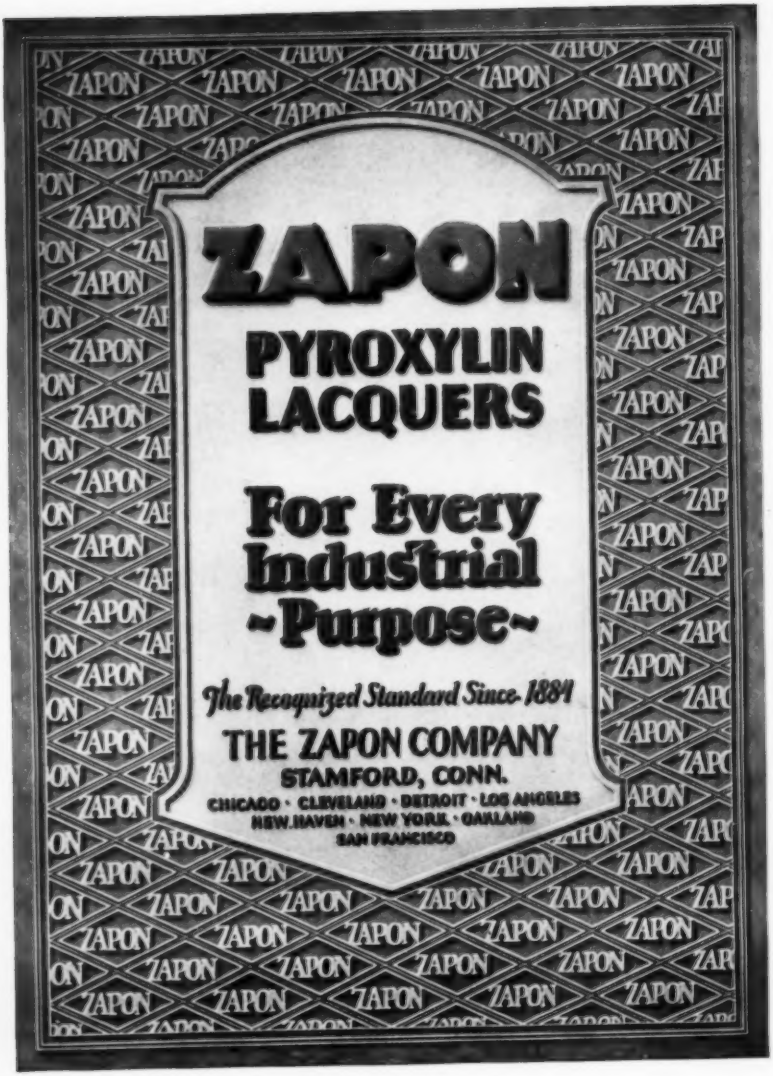
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Industrial Finishing

An Independent Publication Devoted To The Finishing of Industrial Products

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With the Editor

A FINISH Manufacturer, who only recently began to take any notice of INDUSTRIAL FINISHING, is now digging up all the back copies he can get and is reading them carefully. To one of our representatives he expressed amazement at the character and quality of the editorial matter, and declared without reserve that it is of great value to all who have anything to do with finishing. Numerous unsolicited letters from other readers contain similar declarations.

What makes a trade journal valuable to its readers—and in turn to its advertisers? The answer is READER INTEREST! Practical and timely articles written by practical men, for practical men—plus attractive presentation in the journal. A publication carrying editorial matter of this character is the practical man's "authority." He uses it just as the wise motorist makes use of the most reliable and complete sources of information when he plans a trip. The motorist who is interested strictly in business affairs recognizes the importance of taking the shortest, safest and smoothest road available.

So it is with progressive foremen finishers and the executive management of successful industrial plants that use finishing materials and equipment. It is important for them to be well informed regarding routes to various finishing results—to know what certain material, equipment, supplies and methods will do for them—so they can choose wisely what course to take. INDUSTRIAL FINISHING is the logical guide to this objective.

W. H. Rohr

Managing Editor

What is necessary to select wisely

Selection of Finishing Materials

Today the progressive foreman finisher is less of a "medicine man" and more of a real production executive. He keeps well informed on materials, methods and equipment by reading his trade journal

By W. C. Lawrence

THE MAN that has been finishing for 25 years or so ought to be in his "prime," because of the wealth of experience which lies back of him. But to be in his prime a man must keep himself young—in thought at least—and abreast of the times in regard to new ideas and new developments in finishing materials and methods.

During the past quarter of a century, progress in the development of new methods of finishing has been rapid. New ideas have followed each other in such rapid succession that the man of conservative temperament, who believes that within his own shop and within himself is stored all that is worth knowing about finishing, is hopelessly behind the times.

Long experience today is either an asset or a liability. The man that thinks he can continue mixing his own stains and fillers, as he did in days gone by, is behind the times in two respects at least. In the first place he is trying to do for himself that which can be done for him better by the chemist in the laboratory of the stain and filler manufacturer. In the second place, he is doing this work in the most costly way.

The foreman finisher of today is an executive! His chief function is to maintain production. If he spends a large portion of his time experimenting with stains and fillers, production must suffer, since this work leaves him too little time to give to the management of his department.

Specialization

This is an age of specializing. There was a time when a finisher had to do everything from the mixing of his stains to the final rubbing and polishing of the finished article. Today the chemist in the laboratory prepares formulas for stains and fillers. Given a certain color to make, he knows at once what elements must be combined to produce the desired result.

The formulas prepared, the work of assembling the elements in their correct proportions is left to other specialists in the factory. The use of the articles prepared from these formulas is left to other specialists in the finishing room. Here a man becomes an expert at staining, filling, sandpapering, coating with the brush or spray, rubbing and polishing. Each man becomes an expert in his particular line, and as a result he can accomplish more of what he is doing, and do better work.

The foreman also is a specialist. He may know how to do all these things in a way, and know also when they are done properly. But in large shops he is relieved of inspection duty; inspectors are appointed to check up on the quality of the work. The foreman's duty is to see that the work in his department progresses as it should, moving forward to completion without delay. In this he is a specialist, and his success as a foreman depends more on his ability as a departmental manager than it does on his knowledge of how to mix the materials used in his department.

Spraying table rims in multiple, in a factory where economical production is a matter of outstanding importance.

Though it is not necessary for the foreman finisher to know how to mix stains and fillers, it is necessary that he know what are the best of these to use in his department, and the way to apply them in order to obtain the best results in quality and quantity. To know these things he must read the trade journal.

Careful perusal of the reading matter in a journal like INDUSTRIAL FINISHING will keep a foreman well informed in matters pertaining to the use of all finishing materials, as well as matters relating to production. The advertising pages keep the foreman finisher informed regarding the latest offerings in finishing materials.

"Industrial Finishing" Helps

Recently I asked a foreman finisher which he considered more valuable to him—the reading matter, or the advertisements in INDUSTRIAL FINISHING. After some hesitation he replied:

"I can not say, though I read both. They are both so interesting and instructive that it is hard to differentiate. One is supplementary to the other, and when read together they keep the finisher well informed. I consider the careful reading of both editorial and advertising pages essential to successful foremanship. Each issue of the journal is a liberal education in finishing, as it brings before the finisher at one time, the various offerings of the different manufacturers from which to make a selection.

"Since reading this journal I have been able to reduce the time required to do our work by availing myself of the materials best suited to it, and of which I knew nothing before. I have been able to reduce factory costs through the use of these materials, and by the adoption of suggestions contained in the reading matter.

"The firm with which I am connected has made it a rule to allow no salesman to enter the finishing room, consequently I never

have a chance to talk with these men in regard to what is going on in other shops visited by them. I have felt myself handicapped by these limitations, for many of these men are expert finishers, and could give valuable suggestions.

"But with the coming of INDUSTRIAL FINISHING, this handicap has been removed, for this magazine is at once an expert finisher and a salesman—one which I can take into my department, as well as into my home, and have it assist in solving the problems of my work. After the journal has convinced me that we need a certain material in our finishing department I do not have much difficulty convincing those higher up to the same belief."

Avoid Poisoning from Finishing

Through education and progress, attained by research engineers in connection with painting and finishing, a great deal of stress can be laid upon the proper hygienic conditions that now exist in modern paint shops and finishing rooms.

There was a time when it was quite common for painters and those handling paint materials to suffer from lead poison, but fortunately modern manufacturing methods have almost entirely eliminated this condition. However, there are many firms today, who may be unintentionally guilty of fostering unsanitary conditions, in the conduct of their paint and finishing department. As a result there is a menace to health that often times leads to serious and lasting injury.

For instance, there are some rubbing oils that cause skin eruptions, and some persons can be seriously affected by their use. Wood alcohol is another material that was a serious menace in its time, but now it has been replaced by the denatured product, so we can readily see that we have been advancing and in all probability saving eyesight, health, and lives by the attention given this one item alone.

Wiping cloths should be given attention; there is no real economy in the use of unsanitary wiping cloths, and no artisan can afford to jeopardize his health or that of his family by using filthy or diseased wiping cloths, especially when there are firms today who place on the market sanitary wipers which may be purchased at a nominal figure for finishing, painting, and kindred lines.

Then there is ventilation. Much could be said on this one subject but in the final analysis it all sums up to this: That proper ventilation must be provided at all times, not only for the workmen but for the proper drying of all materials.

Considering finishing and painting from a health standpoint, it is an evident fact that only through enlightenment in trade publications like the INDUSTRIAL FINISHING magazine, along these lines as to the proper handling of equipment and materials, can we conserve and practice health standards in the finishing and painting crafts today.—Edw. C. H. Rottmann.

O'Brien Opens Detroit Branch

The O'Brien Varnish Co. of South Bend, Ind., announces the opening of a Detroit branch office at 712 Stephenson Bldg. The Branch Manager is John J. Kroha; sales representatives are Irving Raymo and L. A. Gallagher.

"An account of color mixing, I think will be of interest and help to all color mixers and finishing foremen."—

Joseph M. Verderosa

Mixing and Matching Colors

The author—formerly a lacquer service man and now finishing foreman—explains color values and tells how to mix colors to obtain certain desirable effects

By Joseph M. Verderosa

IN THE mixing and matching of colors, good light is necessary to determine the nature of the sample to be matched. Really, sunlight is imperative. It is difficult to judge colors accurately under artificial light.

In dealing with colors we find they have four essential characteristics:

1—Hue, or the color associated with its name, such as, red, blue, or yellow (kind of color).

2—Value, the name by which the different amounts of light and dark are known (light and dark).

3—Intensity, the amount or degree of color present. A color in its full intensity, at a given value, is as brilliant as can be made at that value (intensity).

4—Neutrality, the opposite of intensity; when one increases the other must necessarily decrease (neutrality).

Primary and Binary Colors

Next we will separate the colors into groups. There are three main or primary colors—*red, blue* and *yellow*. By mixing one with another we get three secondary or binary colors.

Red plus yellow gives orange.
Red plus blue gives violet.
Blue plus yellow gives green.
Colors that are obtained with primary and binary colors are called complimentary colors.

Going back to the primary colors and starting with blue, it will be noticed that all blues belong under two heads—greenish blue and purplish blue. Antwerp blue, Chinese blue, Prussian blue and Cerulian blue show a greenish cast, while ultramarine blue, permanent blue and cobalt blue show a purplish cast.

Red may be classed under two heads—bluish reds and orange reds. With the exception of opal orange, Persian orange, imperial orange, cadmium red, scarlet, chrome red, and vermillion, all other reds have a bluish cast.

Yellows are divided into three heads—greenish yellow, medium yellow, and orange yellow. The medium yellows are typified by cadmium yellow, chrome yellow, and Indian yellow. Orange yellows are typified by cadmium orange and chrome yellow.

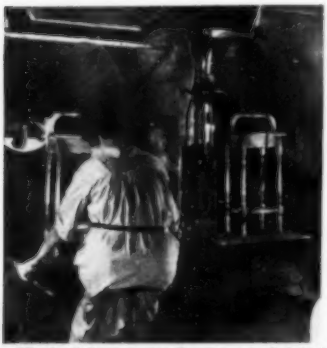
Referring back to binary colors we find that greens incline either toward blue or yellow. Purple inclines either toward red or blue. Orange inclines either toward red or yellow. These facts about colors are quickly seen when white is added to them. The resulting tint shows the cast or under-tone more clearly.

Complimentary Colors

Complimentary colors are broken shades of primary and binary colors; for instance, brown colors are broken shades of either yellow, orange or red. These colors may have been broken with black alone, or with black and either white, blue, green, purple, yellow, orange or red, or a combination of these.

Mixing to Match

Suppose a mixed brown is to be matched. The sample appears closer to burnt umber than any other brown shown—but closer inspection shows that the sample is not quite so deep in tone as burnt umber. Obviously the sample was mixed by adding either white or some other light colors. We add a little white to a bit of



Much of the novelty furniture is finished in attractive colors and given an aged appearance by shading certain portions with the spray gun.

burnt umber and find that our mixture is as light or pale as the sample but not so bright. Immediately we feel sure that yellow instead of white must have been added to burnt umber in mixing the sample; on trial, we find that such was the case.

This furnishes an illustration of the fact that while white pales a color to which it is added, it does not brighten it. Yellow is the color that lends brightness to a mixture. Orange lends brightness in a lesser degree and also adds warmth. Red lends even more warmth than orange and also gives some depth.

Vermillion and orange do not lend depth, but have the effect of orange on mixtures. Blue is the color that lends coolness and depth to a mixture. Green, like blue, is very cold, but lighter greens partake somewhat of the qualities of the yellow, which gives them their brightness.

In a nutshell then, we find that:

To lighten or pale a color, add white.

To brighten it, add yellow.

To brighten and warm, add orange.

To warm and deepen, add red.

To deepen and cool, add blue.

To cool and lighten, add green.

To deepen and warm, add purple.

In the toning of colors, we find that black need scarcely be used as a toning color. Thus, yellow may be toned down by adding purple, red by adding green, and blue is toned by adding burnt sienna, which is broken orange (or red and yellow). In other words, the best way to tone a color is to add its complementary color—except in the case of blue which requires some black to deepen it. Black is to be used as a toner only when unavoidable, as it produces a muddy effect in colors to which it is added. Oddly enough, aniline purple is turned into black by adding tretrogene yellow.

What Colors to Select

The dual nature of colors must

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be kept in mind when making selections for mixtures. In mixing a purple we must choose a red, not of orange but of bluish cast, and our blue must be of reddish purple and not greenish cast. If we choose ultramarine blue (which has no green in it) we can make a fair purple, but if we choose the decidedly green blue and the decidedly orange vermillion, we get a very dirty purple.

In mixing orange it would never do to use bluish red, such as carmine lake or a greenish yellow like lemon yellow; the result would be a dirty, broken orange. But if we use, say, golden yellow and English vermillion, we get a very good orange.

Here are some very useful hints to the color mixer: When mixing colors, it is well to use the lightest color as a base, adding the darker color sparingly. Use very small quantities of colors until the match is perfect. Vivid greens cannot be mixed from blue and yellow, but all can be mixed from green lake and white or yellow. Never use a bleeding red for mixing colors. Remember too, that dryers darken all colors to which they are added.

New Color Designs For Furniture

Some new and striking color designs in furniture include the following:

A grand piano of Chinese Chippendale design, in which the whole case is in black with a dull finish, while the inside of the case is Chinese red high-lighted with a dark brown. The supports which join the three legs are carved in Chinese design lined with red. The Chinese motifs on the case are picked out or accented with red. Chinese red felt is used throughout to carry out the design.

Another grand piano in Chinese Chippendale design, a sister-piece to the above, has been done in Chinese green.

A new suggestion in furniture appears in a Martha Washington sewing table. The lid of this piece is finished in cream and red, the body in red with the face of the drawers in cream. The drawers have a floral decoration. Edges of the lid are finished in gold rubbed with red. Gold rubbed with red is also repeated in the turnings of the legs.

Another color suggestion is seen in a gate leg table of which the top is in black with a hair line stripe of Chinese green just inside the edge. The edge of the table itself is done in old rose. Old rose is repeated on the turnings of the legs alternating with Chinese green and black. The supports are in black. The turned legs in three colors make an interesting contrast to the top in black with its old rose edge.

These new color suggestions are in line with the brightly colored furniture which has been helped in popularity by the wide use of hooked rugs. The increasing vogue of Spanish interiors, with their red and yellow brocades, are also responsible in part for the new vogue of colored furniture. One or more pieces of colored furniture in a Spanish setting have been proved to be highly attractive. Tile flooring and colored linoleums have also helped towards enhancing the beauty of colored furniture.—Duco Color Advisory Service.

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Suggests more co-operation between finishers and manufacturers

Proper Handling of Complaints—I

An industrial finishing salesman of several years experience, explains what steps will lead to the successful investigation of complaints and the righting of wrong conditions

By Dan Youngs

SO MANY articles have been published in INDUSTRIAL FINISHING relative to the technical and practical sides of this giant branch of national industry, it has occurred to me that a few words on another side of this subject might not be amiss.

As an industrial salesman of many years experience I have naturally met with all sides of the finishing problem—sales, service and complaints. It is with the latter that I wish to deal in this article. No matter how large the manufacturer of finishes may be; no matter how carefully each formula is developed and checked; wherever the human element comes into the manufacture of any product, there is always a chance for errors.

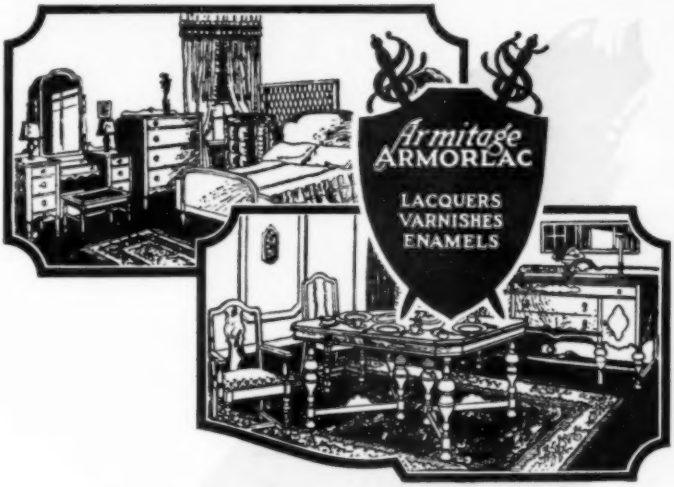
Many Elements Involved

This is particularly true in the finishing game, for in addition to the possibility of error in the manufacture, there is also a possibility of error in the application. The uses of finishing materials are so diversified that in regard to their application, there can be no set rules which will fit all cases. A difference in seasons, temperature, humidity, reduction and dozens of other things, all affect this line probably more than any other materials manufactured.

The manufacturer cannot foresee the shop conditions or the methods by which his products will be used in every instance. In fact, it is probable that no two shops using the same material employ the same method of application in every degree. A slight difference in the reduction, the kind or amount of reducer used, a difference in the air pressure, a difference in the distance or the angle at which the gun is held—all may cause a totally different result although the same finishing material is used.

For this reason, a complaint against any material made by a reputable manufacturer should be approached by both sides with an open and unprejudiced attitude—both admitting the possibility of error, and combining their knowledge to search for and remedy the fault. I know a manufacturer who claims that 99 percent of the complaints are the fault of the finisher, and I know finishers who feel that it is impossible for them to make a mistake—that the material is always at fault. This is the wrong attitude to take, for a deadlock exists at the start, and this makes it much harder to get down to concrete facts.

It is far better to start with the mutual knowledge that something is at fault, and to carefully



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trace each step, both of manufacture and application, wherever possible. If this were done by both parties there would be far less friction and less changing of materials heretofore found satisfactory.

The Logical Procedure

Now, granting that starting with an unbiased mind is proper, the next step is naturally an inspection of the product on which the finish shows a fault. In most cases, a mutual agreement that something is at fault will be self-evident. Thus a second degree of agreement is reached. Of course, where there is a personal friendship and acquaintance existing between the finisher and the salesman or representative these things are easier to trace, but where these men are not well acquainted, each must necessarily take the other on trust.

I am assuming, of course, that the salesman knows his business thoroughly. If he does not, he should always ask his house to send someone from the office or factory who is thoroughly conversant with the manufacture and application of the materials in question.

Investigate the Surface

After the above—which may be termed the contact point—is established, there follows a series of steps which should be thoroughly investigated. These naturally differ with the classes of products, but in all cases the preparation of the surface should be looked into first. If it is a wood article, find out if the wood was thoroughly dry; if the surface is metal, find out if it was clean and free from grease or rust.

We know that in industrial finishing a proper preparation of the surface is a most important point. No finishing material can be properly used over a wet, dirty or greasy surface, no matter who the manufacturer is, or with what care and diligence it is applied.

The Reducer Used

The next step is to investigate the reducer, providing any was used. In these days of mineral-spirit reducers there is more danger of trouble from this source than a few years ago, when pure spirits of turpentine, or linseed oil were practically all that were employed. When the turpentine market soared to heretofore unknown heights, a cheaper reducer was necessary; thus the day of mineral-spirit reducers came into being. Today it is rare indeed to find only pure turpentine used in industrial finishing rooms.

The safest course is to buy a regular paint and varnish reducer, sold either by a paint manufacturer or a reputable refiner; even then there is the danger of heavy ends. Some shops use gasoline, kerosene or a combination of both, although it is well known that kerosene leaves a greasy film and good gasoline is hard to get. The use of either of these is not compatible with good finishing.

After a decision that the reducer used is okeh, the amount and manner in which it was used must be investigated. The amount is governed by the body or consistency of the finish, but the manner in which it is mixed has something to do with the question. I have seen finishers pour the total amount of the reducer required into the finish at one time, whereas better results will always be obtained by adding a little at a time and stirring con-

stantly. With the proper reducer used, and properly added, there should be little trouble traced to this source. It is better, however, for the finisher to find out from the manufacturer just what reducer should be used with each particular product.

Equipment Employed

In regard to the equipment by which the finish is applied, one of the most important things to watch is cleanliness. If a brush is used, care must be taken to see that it is thoroughly clean. If it is "lousy," or has been washed out in kerosene, it naturally follows that the finish will be injured. If spraying is practiced, not only the gun, but the hose or cup must be clean. This is especially true where lacquers are used. If any is left in the gun or hose, the next application of lacquer will soften it up and trouble will follow.

(To be continued.)

Finishers' New Shop Soap

Keewaugan Products Co., Inc., of North Chicago, Ill., announces that its new product, "Solusoap," which has been developed after a number of years of experimentation, will remove lacquer, ink, soap, paint, oil colors, etc., from the hands and will also restore to the hands, the natural fats and oils which the various materials have removed from the skin.

The new soap lathers freely and instantly in any water—hot or cold, hard or soft. Because of its exceptional spreading qualities, only a small amount is necessary. Nothing is left on the skin to irritate. It draws foreign matter from the pores of the skin without the use of any injurious substances. It also heals cuts and abrasions of the skin.

"Solusoap" is used most effectively in the following manner, if the hands are very heavily coated with lacquer: Wash the hands with thinner first; then, without allowing the thinner to dry, rub a small amount of Solusoap thoroughly into the skin and then wash until clean with water. This will leave the hands clean, soft, and smooth.

New Automobile Finishing Book

New developments in the automobile finishing trade have come so rapidly in the past few years and so many of the old methods have been replaced that much published information available concerning this phase of finishing is now obsolete. Realizing the importance of an authoritative reference book, covering the latest approved methods of automobile finishing, Mr. Marvin James Pearce, whose articles have appeared in INDUSTRIAL FINISHING under various pen names, has spent considerable time and labor in preparing such a book.

Mr. Pearce is a chemical engineer, a consulting engineer of finishing materials and methods, and a member of the Society of Automotive Engineers. The new book, "Modern Automobile Painting", is a practical treatise on equipment, material and methods for finishing automobiles with paint, varnish, enamel and lacquer.

Chapters are devoted to all operations in motor-car finishing with full explanations and detailed information as to the procedure of each step. There are chapters on "The Automobile Painter's Tools", several chapters on the methods of applying the various kinds of finishes on both old and new work, one on the "Refinishing of Old Cars" and one of especial interest to the shop owner covering "Design and Care of the Shop." The last four chapters are devoted to the "Care of the Spraying Equipment", "Care of the Automobile Finish", "Records and Cost Finding" and methods of "Bringing New Business Into the Shop".

The book has 296 pages, 65 illustrations and is bound in a durable and attractive cover. It is copyrighted by David McKay Co. and priced at $3.00. Copies can be ordered through INDUSTRIAL FINISHING.

SMOOTH

It looks and feels like
rubbed work

RED S. FLAT FINISH

Write for samples and full information

The Schaefer Company

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LOUISVILLE, KENTUCKY

Manufacturers of
VARNISHES *and* LACQUERS

Dear Mister Rohr: the time is ripe,
For you to set in place the type
To print what I'm enclosing you,
For this you told me you would do.

I've written, sir, the best I could
Concerning how to finish wood.
I tell you, sir, I have the stuff—
So, I hope you think it good enough.

I've mentioned woods both soft and hard,
I've torn it off, sir, by the yard
So I hope this article will do
And that I'll get a check from you.

And if from you I get a check,
I'll write again, I will by heck,
I'll write some lines that will be good,
Concerning how to finish wood.

John A Twamley

Wood Filling, Staining and Finishing

Foreman finisher calls attention to some of the principles involved in practical wood finishing and gives recommendations for finishing certain close and open-grained woods

By John A. Twamley

AS A PREFACE to this article I will say, that the practical wood finisher recognizes two particular classifications in woods, namely, close-grained and open-grained woods, and it is very necessary to know which is which, when about to do a finishing job.

Among the most commonly used close-grained woods are—yellow pine, redwood, spruce, white pine, maple, gum, poplar, cypress and birch; among the open-grained woods—pitch pine, walnut, ash, oak, rosewood, butternut, chestnut, mahogany and elm.

Open-Grained Woods

Now, an open-grained wood requires filling with a paste filler in order that the open places or pores in it may be made level with the surrounding surface. This is done in order to prevent the absorption of varnish or lacquer when it is applied.

Though classed together, woods will be found to differ to a considerable degree in regards to their structure. For instance, walnut compared with oak. Ash, chestnut and oak are particularly open-grained, while the other woods I have listed as being in the open-grain class are not so open, and some woods, pitch pine for instance, are both open and close-grain on the same piece of wood.

Close-Grained Woods

Now the close-grained woods should be filled with a liquid filler. For instance, a varnish containing the same pigment material as that in paste filler, but

Ed Smith's Page

Have you written *for my* FREE Panel?

For several months I have been telling you about some of the features in our "Balanced" Escolac Lacquer Enamel.

For example, through the proper balancing of high-boiling solvents with a nitro-cellulose base we have discovered how to eliminate a considerable percentage of the usual waste through evaporation. Also we are able to carry a higher percentage of solids. As a result we effect three things. *First*, we get more lacquer onto the surface. *Second*, we get improved building qualities. *Third*, we get greater coverage per gallon.

I have suggested that you write for one of my panels showing the results secured with Escolac. A lot of men have written for it. If you haven't, I wish you would write your name and address on the margin of this page and mail it to me. I want you to see one of these panels and compare with the results you are now getting. Everyone, so far has been impressed with this new lacquer product. I believe you will be, too. No charge or obligation, of course.

Ed Smith

EDWARD SMITH & COMPANY

Makers of Paints and Varnishes for 100 Years

127 West Avenue
Long Island City, N. Y.

thinned down more with varnish; or one may use shellac as a filler or sealer. Sometimes it is advisable, in the case of very coarse-grained woods such as oak, chestnut and ash, to first apply a coat of raw linseed oil. If you do this the wood will not greatly draw on the varnish when it is applied. So much on preparing woods.

Finishing Red Gum

Now let us proceed and finish at least one of them. Suppose we will take red gum. This wood makes an attractive finish with mahogany stain. It's figure is handsome. It may also be finished without using a stain, it's natural color showing through the slight staining effects of the varnish in itself being very attractive. But as a usual thing it is stained.

Red gum does not have to be filled, but it should be shellaced. Walnut, mahogany and brown stains show up well on this wood. After the shellac, give it two coats of varnish. Filler is very injurious to the figure of red gum and even expert finishers, not knowing this, sometimes fill it.

Finishing Walnut

Now that we have finished our red gum let us finish a piece of walnut. When finishing, always stain it first; then, when it is dry, apply a paste filler. If the wood happens to show light spots here and there, touch them up first with the stain. Let it dry, then apply stain all over the surface. Be sure to use a water stain.

The filler must be colored with Van Dyke brown or burnt umber with a little black in it. The finish is in varnish, either with or without luster.

Follow these instructions when finishing red gum, and walnut, and I am sure the result will be satisfactory.

The automotive industry is using controlled air and ventilating equipment on a scale never before attempted, to prevent serious fires and explosions in the paint shops and body plants, according to production engineers of the leading companies.

Southwest Manager for Kellogg

Kellogg Mfg. Co., of Rochester, N. Y., announces that Mr. B. M. Parker has been appointed District Manager of the Southwest territory.

Renaissance Oak Finish Booklet

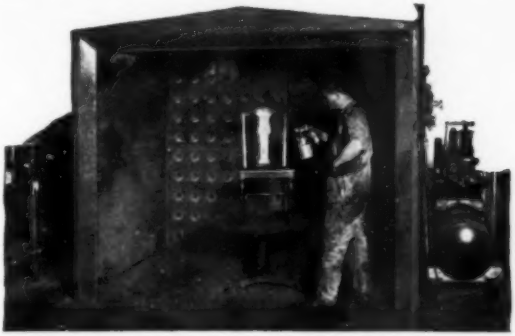
"The Coming of Renaissance Oak" is the title of an interesting illustrated booklet of 12 pages which is being distributed free by the E. I. du Pont de Nemours & Co., of Parlin, N. J. Anticipating the return of oak into more extensive favor as a furniture wood, the du Pont Co. has made a study of oak finishes and published in this booklet complete descriptions of newly-developed, attractive oak finishes which are illustrated with plates in natural color.

Two Companies, Bradley-Hurtz Co., and Bradley & Vrooman Co.

Bradley & Vrooman Co., of Chicago, developed through the years virtually two businesses. One, the manufacture of industrial finishing products; the other, shelf goods, each with its own factory and sales force.

These two divisions are now separate in ownership. The Industrial Division is known and incorporated as Bradley-Hurtz Co. The Shelf Goods Division, selling its products to jobbers and dealers, will be retained by Bradley & Vrooman Co., with the same plant and organization as in the past.

Bradley-Hurtz Co. has taken over the properties at 2624 to 2630 and 2709 to 2713 So. Dearborn St., and with the same organization as in the past is there conducting the manufacture and sale of paints, enamels, stains, fillers, lacquers and varnishes for the industrial or manufacturing trade. Additional new and improved equipment and facilities are being installed.



A Binks Baffle-Plate Booth in Use.

Here's PROGRESS

An entirely new and revolutionary development in Spray Booth engineering we announced recently, is meeting with the heartiest approval of its users.

Many finishing superintendents have already taken advantage of this Baffle-plate idea. Binks Spray Booths now have 3 series of Baffle-plates with perforations in staggered position. The exhaust clarifies the air more efficiently over the entire area of the booth. The Baffle-plates lift off in a jiffy for cleaning, thereby saving hours of tedious work. Material is scraped from flat surfaces only. The settling chamber is more accessible than ever.

Binks Baffle-plate Spray Booths are built in all sizes, floor types, bench types; and may be set in any position to favor light. It will pay any plant executive to know the details of this new time and labor-saving development. Write for "Bulletin 57."

Write for this Bulletin.

If you have not yet received this Bulletin, get it now. Every finishing foreman will find in it many new ideas, by specialized engineer, which will greatly benefit him. We will gladly send this "Bulletin No. 57" to you upon request. Write for it today.

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Removing Lacks from Lacquers—I

Defining modern lacquer, revealing what materials it is made of, explaining how some lacquers have lacked certain qualities, and pointing out what is required of a satisfactory lacquer

By R. L. Masterson

MODERN nitro-cellulose lacquers are almost invariably composed of six main types of raw materials, each of which will be discussed individually in this article. It should be noted here, however, that many of the so-called lacquers today do not contain these six types of raw materials. In fact, the word "lacquer" is so much abused that it is almost necessary to use an adjective with the word to prevent misunderstanding.

The definition in Webster's dictionary is hardly adequate. One definition is: "A varnish consisting of a solution of shellac in alcohol." A second definition is: "Any of various varnishes with a resin as the base; specifically the natural varnish obtained in Japan from the sap of a species of sumac."

The first definition does not apply at all, as solutions of shellac in alcohol are universally referred to as "shellac," never as "lacquer." The second definition applies to only one kind of lacquer, totally foreign to this country and known as Japanese lacquer or Chinese lacquer. Thin-bodied, oleo-resinous varnishes were formerly referred to as lacquers, in many instances. Today the term has degenerated until practically any quick-drying, thin-bodied material may be called a lacquer. Many of the more recent and lower-priced lacquers are little more than solutions of various resins, in suitable solvents to form substitute shellac solutions and often contain little or no nitrocellulose.

Materials of Modern Lacquers

To get back to modern lacquers of a true nitro-cellulose character, the first raw material to be considered is nitrated cotton, nitro-cellulose or "gun cotton." This can be made from any material whose chief constituent is cellulose, but the present chief source of supply is raw cotton fibre. It is not necessary to use the long fibers which are valuable for making cloth; the short fibers which adhere to the cotton seed serve equally as well. These short fibers are known as "cotton linters" and are stripped from the seed along with a portion of the seed itself by means of special machinery.

The linters are contaminated with oil, wax and hull fibers as they are taken from the seed, and these impurities must be removed before the process of nitration begins. This is accomplished by repeated washing with various chemical solutions, followed by water to remove all traces of the chemicals.

After this the purified linters are dried thoroughly and then nitrated by treating the cotton with a mixture of sulphuric acid and nitric acid for the proper length of time. The strength of the acid mixture, the length of

"For sixty years the Murphy Varnish Company has been making varnish. Sixty years is a long time—long enough to test any finish, or any reputation. If the Murphy Company has a reputation for making good finishes, it must be because throughout that sixty years it always tried to make the best it could."

IT MAKES A *BETTER* SHELLAC
at less cost

Mix your shellac with Murphy Waterproof Mixing Lacquer to make it waterproof, tough, adherent. Mixes run from equal parts up to one part Murphy Waterproof Mixing Lacquer to four parts shellac, according to purpose. Apply as you would ordinary shellac.

HERE ARE THE HIGH POINTS IN THIS MIXTURE

Costs less than straight shellac
Increases elasticity of finish
Better flowing qualities; sprays better
Dries as quickly as shellac
Builds a fuller finish
Greatly increased durability
Absolutely waterproof
Cuts sanding cost almost in half
Seals as well as shellac
Increased anchorage due to better pore penetration
Prevents shellac from scratching white
Eliminates pin holes

All these advantages may be secured and cost decreased. It is to your interest to see this material demonstrated; write us.

Murphy

WATERPROOF MIXING Lacquer

MURPHY VARNISH COMPANY
NEWARK · CHICAGO · SAN FRANCISCO · MONTREAL

time, the temperature and other factors all have a bearing upon the type of nitro-cellulose finally produced. For different purposes the cotton is nitrated in different degrees, but for furniture and automobile lacquers nitro-cotton of about 12 percent nitrogen content has been found most adaptable.

Nitration of Cotton

The next step after nitration is to thoroughly boil and wash the nitro-cellulose until all traces of the acids have been removed. The water is then removed by forcing denatured alcohol into the nitrated cotton as the water is forced out. This is done to eliminate danger of explosion, for nitrated cotton, as used in the manufacture of lacquer, is somewhat similar to gun cotton and gunpowder which are harmless while moist but explosive under certain conditions when dry.

The nitrated cotton is very similar in appearance to the original cotton, but it has entirely different properties. When an open flame is applied to raw cotton it burns rather slowly. Nitrated cotton, however, takes fire with a flash and is quickly burned. Raw cotton is practically insoluble but its relative, nitro-cotton or nitrated cotton, is quickly soluble in many solvents.

Film scrap, celluloid scrap, reclaimed smokeless powder and similar materials containing nitro-cellulose are sometimes used in place of virgin nitro-cotton for making lower grade lacquers, but the best lacquers are usually made from the virgin nitro-cotton.

Nitro-Cotton Solvents

It is customary to dissolve the nitro-cotton, while still wet, with about 30 percent of alcohol, in a suitable combination of solvents, which constitute the second class of raw materials. Formerly amyl acetate and fusel oil were used almost exclusively for dissolving nitro-cellulose, but today there is a long list of suitable solvents, and chemists are developing new ones from time to time.

No one of these solvents is used alone. A combination is used which will give the proper solvent action on the nitro-cellulose as well as the right scheme of evaporation to insure easy application, proper drying, a smooth surface and freedom from turning white or "blushing."

By placing a small quantity of raw cotton in one test tube and a similar quantity of nitro-cotton in another one, then adding a quantity of a good solvent, like ethyl acetate, it will be found that the nitrated cotton soon goes into solution, while the raw cotton is unaffected. The nitrated cotton solution thus produced is the simplest form of nitro-cellulose lacquer. It will be noted also that the solution of the nitro-cotton in the solvent greatly increases the viscosity of the solvent.

What Early Lacquers Lacked

For many years this was the type of lacquer used on silverware, lighting fixtures and many similar articles. This type of lacquer is entirely unsuited for finishing furniture or automobiles, as it lacks the necessary adhesive properties or sticking power and can be pulled or stripped from coated surfaces quite easily, once the film has been broken. This is one of the "lacks" that had to be removed

Paasche equipment leads in all three essentials

ONE air-finishing equipment may give a fine finish. Another may be economical to operate, and a third may possess great safety.

In Paasche Air-finishing Equipment, however, you find the highest excellence in all three essentials—perfection of finish, economy of operation, and safety.

Perfection of Finish—The air conditioner delivers clean, oil-free air to the multiplehead airbrush—the airbrush sprays evenly at any desired angle from a fine line to a wide spray.

Economy—The multiplehead airbrush sprays quickly without need of retouching blemishes or going over. The pneumatic rubbing machine works at 1600 reciprocal strokes-per-minute, saves time and fatigue. Every unit is carefully designed for long wear.

Safety—The ventilating cabinet motor fan pulls the air through removable baffles which catch all paint fumes, increasing output by improving working conditions and reducing fire risk.

The benefit of our 20 years' experience on your problems is yours without obligation. Ask for it.

Paasche Airbrush Co.

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The Largest Exclusive Manufacturers of Air Finishing Equipment

IF9–Gray

from lacquer before it became a commercial success.

Another bothersome "lack" of such a lacquer is that the proportion of solid matter is very low and as a result the dried film is very thin, thus requiring a large number of coats to produce a finish of visible depth. This trouble is further increased by the viscosity of the solution, making it necessary to add various amounts of thinners or reducer to make the lacquer thin enough for easy application. This addition naturally decreases the proportion of solid matter and makes the dried film even thinner.

Gums or Resins Used

The first step in removing these "lacks" of lacquer was the discovery of a method to reduce the viscosity of the nitro-cellulose solution, so that larger quantities could be dissolved in a given volume of solvent without having the resultant solution too heavy for easy application. The lack of adhesion was also overcome by the addition of solutions of various gums, similar to those used in the manufacture of varnishes. In addition, the gum solutions further increased the proportion of solid materials without appreciably affecting the viscosity.

Gums or resins, then, are the third class or type of raw materials. The kind of gum varies, depending upon the results desired. Damar, shellac, kauri, manila, congo, ester or other gums may be used. Frequently a combination of these resins are employed.

Call for Another Ingredient

Now it so happens, that many of the solvents for nitro-cellulose are non-solvents of resins; likewise solvents for resins are usually non-solvents for nitro-cotton. It was quite a trick to get the proper proportion of the various liquids necessary to hold both materials in solution and at the same time give the other desirable properties.

The question of proper solvent combination is of greatest importance in making good lacquers. If the proportion and type of solvents is not right many difficulties are likely to occur; for example, blushing or turning white upon drying, poor tensile strength or rottenness of the film, precipitation of one or more of the ingredients from the solution upon standing, and similar troubles.

The gums or resins are usually dissolved separately from the nitro-cellulose and the two solutions blended together later. These solvents for resins, which are not solvents for nitro-cellulose, are known as dilutents—fourth class of raw materials. These consist of such liquids as benzol, toluol, xylol, naphtha and similar substances.

Step by Step Development

While the gums add certain desirable properties to the lacquer, if nothing further is added they impart a few disadvantages or "lacks." The principal one is brittleness or lack of toughness. The nitro-cellulose solution to which gum has not been added, dries to a very hard tough film which, however, lacks adhesion. The addition of gums improves the adhesion, the thickness and the rubbing properties of the nitro-cellulose film, but unless used in conjunction with the proper types and quantities of softeners—or plasticisers which are the fifth type of raw material—the gums also have a ten-

LACQUER
GLOSSY—FLAT

Our glossy body lacquer can be polished to produce a very high lustre. It will not chip or check—sprays freely.

For a dull-rubbed effect our flat lacquer produces an excellent finish at low cost . . . where competition is keen this particular material will be found extremely advantageous.

These lacquers are not an experiment—they have been tried and tested and are being used very successfully by hundreds of furniture manufacturers. We spent years developing them, and were firmly convinced that they would accomplish all that would be expected of them before we offered them to the trade. Liberal samples on request.

Indianapolis Varnish Co.
131-147 NORTH PINE ST.
Indianapolis, Indiana.

dency to decrease the toughness and elasticity of the film.

There are two main types of softeners. Some are non-evaporative, such as castor oil and other non-drying vegetable oils, others are slowly evaporative, such as camphor. Each type has its advantages and disadvantages. If too much of certain slowly-evaporative softeners are used, a film will be produced which is tough after it has just been applied but which may become brittle with age after the softener has evaporated. On the other hand, too much of the non-drying oil type must not be added or the finished product will not dry quickly. It is an art developed from years of experimentation to know what softeners and the proportions of each are required to give the desired properties to a lacquer, according to the use to which the lacquer is to be put.

Next month the concluding installment of this article will take up pigments—the sixth class of raw materials used in lacquers.

Architectural Fir Finish

Some industrial finishers may draw a suggestion of value from the following, which is part of the architect's own description of the house winning first prize in the recent West Coast Woods Architectural Competition. It was designed by Otho McCrackin, Hutchinson, Kansas, who was awarded the $2,000 cash for first prize.

"The standing finish (woodwork) in living room, entrance hall and dining room is to be of Douglas fir, the ceiling and fireplace beams to be hand hewn. All to be lightly sand-blasted, after which a stencil of metal shall protect the surface exposing the design, this is then to be heavily sand-blasted after which a blow torch is to be applied to surface in not too even a manner.

"All to be stained a brownish gray, with portions of the design brought out in rich deep color.

"The ceiling of the living room is to be of V-cut ceiling, random widths, with simple designs at various unexpected points worked cut as described above.

"The vertical siding, as shown on front entrance detail, to be of Douglas fir, and is to have V-cut joint at center with battens covering the other joints. This siding is to be sand-blasted before placing, and finished with a weather gray stain as balance of siding."

Drying and Moving Material Faster

Evidence that reveals the increasing use of the late type equipment for accelerating the application of stain and the drying and moving of freshly-stained wood parts, is found in the new woodworking building of the American Seating Co. at Grand Rapids, Michigan.

The accompanying picture, snapped in the finishing department of this progressive concern, shows part of the conveyor line which carries school desks and seats on edge from the stain dipping tank. The conveyor has projecting prongs of iron, between which the pieces are placed on edge to travel by conveyor over a long drain pan.

In this picture the dip tank is far in the background and the newly dipped pieces are traveling toward the observer. Drying of the freshly-stained wood surfaces

Still Another

Spraco Achievement

A Pressure Cup Gun

For { Undercoats / Heavy Lacquers and Paints } *Saves* { Thinners and Time }

Note Eight of Its Important Features:

1. Puts into the hands of the refinisher a cup type gun with the advantages of the pressure gun.
2. Will handle the heavier lacquers recommended by manufacturers which are beyond the capacity of the suction type gun.
3. Instead of using approximately 50 per cent thinner and 50 per cent material, the usual mixture for a suction type cup gun, this new Spraco Pressure Cup Gun will handle a mixture of 25 per cent thinner and 75 per cent material.
4. Speed of application is twice that of the usual cup gun, using the thinner mixture.
5. No powdered surface as the speed of application gets material on wet enough to blend into a proper finish.
6. Gun while spraying may be held in any position without leakage as there is no open vent hole
7. Requires same amount and pressure of air as the ordinary cup gun.
8. A specialized standard Spraco 14-A Gun which assures quality of workmanship and spraying results, heretofore unknown in a cup gun.

Further information given on request, better ask for Bulletin 103-P and save time

Spraco Painting Equipment Company

60 High Street Boston, Mass.

is accelerated by a down draft of warm air, which is piped across the passageway, from a unit heater shown at the right. Inside the sheet metal cabinet of the unit heater are steam coils and a motor driven fan.

Air can be drawn into the heating cabinet, either from the inside or outside of the building. It is heated as it moves through the heating chamber, and the resulting warm air is blown through piping which spans the passageway and elbows down, as shown in the picture. The blowing of this warm air across the sides of the seats and backs, as the conveyor carries them slowly forward, speeds up the drying of the stained surfaces to such an extent that they are surface dry when they reach the end of the conveyor line.

At the discharge end of the slow-moving conveyor the seats and backs are inspected for thoroughness and uniformity of staining. The rejects are sent back by gravity roller conveyor to the stain operator, who is obliged to touch them up with a brush or dip them again—according to conditions—and send them over the route again.

Material that has been satisfactorily stained is also moved away by a gravity roller conveyor, but it is sent to the next finishing operation which follows staining. This equipment operates smoothly, noiselessly and efficiently. The conveyor is the roller chain type, and it is driven at the discharge end by a motor through suitable reduction gearing.—F. W. Worthington.

Warm air from the heating unit at the right is blown over the freshly stained surfaces of wood parts, which are being moved slowly by a long conveyor line at the left.

"Wears like Flint"

During a recent call made by one of our representatives, the conversation ran about like this:

"I've talked to twenty-one varnish and lacquer salesmen so far this week (it was then about Wednesday) so make it snappy."

He replied: "Regardless of what you are using in the Lacquer or Rubbed Effect Varnish line **we can beat it for quality."**

The buyer said: "I'm from Missouri and you will have to show me."

He answered: "That's *the way we get a majority of our new customers*, viz: *by showing our goods in direct comparison to what is being used and once we get them we hold them.*"

We showed him and he is now a regular customer.

We can also "show you," if you are open to conviction and can thereby help your business.

THE CLEVELAND VARNISH COMPANY

Established 1881

3111 EAST 87th STREET

Cleveland, Ohio, U.S.A.

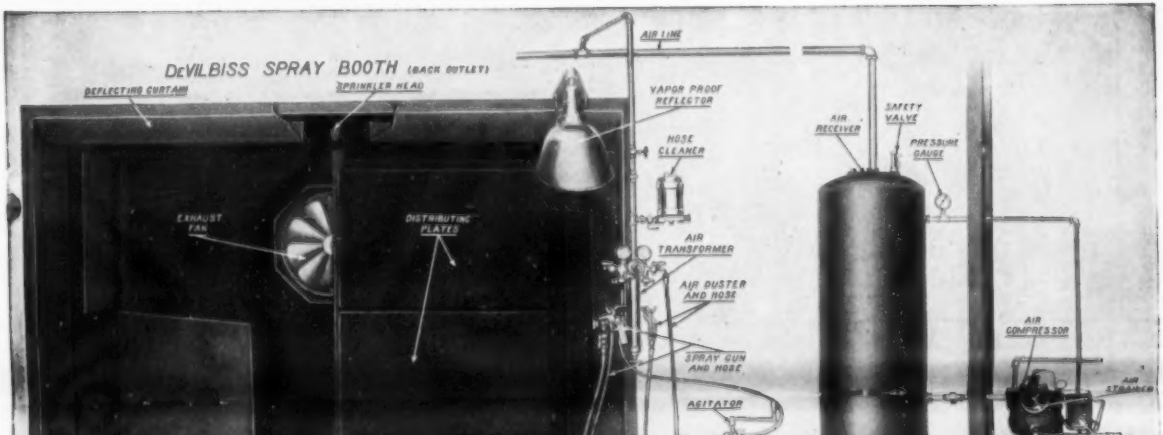
MAKERS...

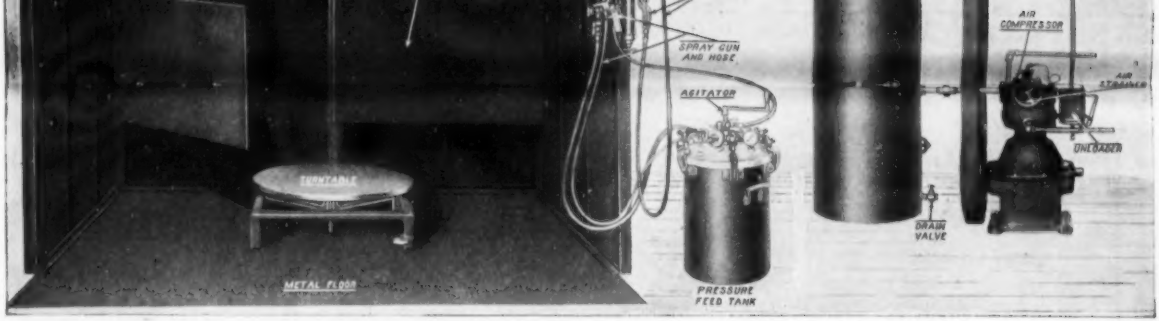
Varnishes, Lacquers, Enamels, Undercoatings

The answer to Complete, Dependable and Low Cost Service in your finishing room

DeVilbiss Spray-finishing System

Here shown in typical complete installation





SOLVING the important problems of the finishing room, for well over fifteen years, in leading manufacturing plants the world over—plants of every size and character, producing every type of product—is the pre-eminent performance background of the DeVilbiss Spray-finishing System.

This background of invaluable DeVilbiss experience and intimate contact with the world's entire industrial field is of first importance to you ... Out of it has been developed today's unequalled DeVilbiss engineering, manufacturing and service facilities and the high perfection of DeVilbiss spray-finishing equipment ... And with this equipment and these facilities to serve you, there is insured complete and efficient solution of every problem of lacquer, varnish and other material application in your finishing room, plus reduction of your finishing costs.

Each item in the DeVilbiss line of spray-finishing equipment is scientifically correct in design, entirely practical as a production tool, easily installed and used. The complete installation soon pays for itself.

Consider what this complete, dependable and low cost DeVilbiss service in your finishing department means to your manufacturing operations and costs. Further interesting facts will be promptly mailed to you. Address—

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Spray-finishing System

Invite us to show you

Sun Flat Lacquer

We will display our goods at our expense, and give you practical advice. How best to use.

White No. 1 Lacquer

COLORLESS

Clear and transparent, looks like a coat of celluloid on work. Can be polished.

FINISHING ROOM FAVORITES

No. 115 Pale Rubbing

The reliable quality varnish that held its own so many years in the face of keen competition.

SUN VARNISH CO.

Louisville, Ky.

Latest type Martin Navy Bomber with all-metal structure.

Protective Coatings for Airplanes—I

Chief Engineer of The Glenn L. Martin Co. calls attention to problems involved in finishing the metal, wood and fabric portions of modern airplanes and explains how these parts are coated for protective purposes

By Lessiter C. Milburn

MUCH ARTISTIC talent good and bad, has been exercised to enhance the graceful beauty of flying airplanes, but the fundamental purpose of finish-coatings applied is to preserve the original strength or utility of the various parts of the machine.

It is vitally necessary to preserve the surface and hence the original strength of the framework of the wings, body, tail surfaces, and landing gear, in order to avoid the excess weight which would be entailed if these parts were made oversize in anticipation of weakening by corrosion. This problem is particularly difficult because of the severe exposure to which planes are subjected. Between San Diego and Paris, Lindbergh's now famous "St. Louis" was exposed to seacoast atmosphere, desert sun, and sand storms, cold misty air at high altitudes, sleet, rain, and sea water vapor, not to mention gasoline and oil, all in rather rapid succession.

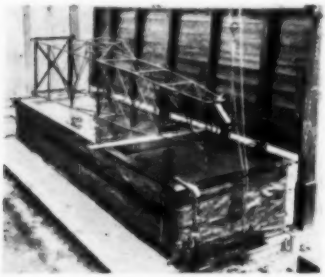
The principal materials which require protection in aircraft are steel, aluminum alloys, wood and fabric.

Finishing Steel

Steel is used in the form of tubes, plate fittings, tie-rods, bolts and shaped sections. If scaled from welding or heat-treatment it is sand blasted with shot-size sand, or pickled in any good commercial cleaning solution. If not scaled, it is washed in a grease-solvent such as benzol. Tubular frame-work is completely immersed in a medium grade "tempering oil" which is admitted to the inside of the tubes by holes drilled for the purpose. The oil temperature is 250-deg. F., which is high enough

to vaporize and expel any moisture. After five or ten minutes the frames are removed from the oil and drained. The drain holes are soldered shut and the framework is washed and cleaned in benzol.

After this it is painted by spraying, usually with a bituminous-base paint. The first coat is applied thinner than the second final coat. Red lead or aluminum enamel are sometimes used instead of bituminous paint. Small steel parts such as bolts and fittings are frequently plated with zinc, by electrolysis, before painting. Black bituminous paint has been found superior to aluminum-pigmented bituminous paint for steel work.



A 3,000 gallon dipping vat for tubular steel frames.

Aluminum powder, usually 140 mesh "polished," is used in many aircraft paints because the aluminum, when properly "leafed" in the vehicle has a high reflective power for the destructive short wave, or actinic rays of sunlight. One and one-half to two pounds of powder are used per gallon of varnish.

Finishing Aluminum Alloys

Aluminum alloy parts present by far the most important problem in aircraft finishing at present, due to the desirable light weight of these alloys and the destructive action of sea water and sea-coast atmosphere upon them. This problem has been much misunderstood, because some alloys of aluminum are less susceptible to sea-corrosion than others, and because aluminum alloys require no protection in ordinary inland atmospheres.

Variations in sea-water analysis in different parts of the world have also added some confusion. Furthermore, some alloys of aluminum show only surface erosion similar to rust of steel, while others suffer breakdown of their inter-granular structure when exposed to sea-water.

With increased activity and scope of travel of airplanes it is becoming more evident that all planes intended for general use must be protected from sea-atmosphere attack, because the original or subsequent purpose of the planes may easily involve flying near our lengthy sea-coast line.

The aluminum alloy parts in airplanes are made from sheet and rolled or drawn shapes, and in some few instances from tubing. Aluminum alloy castings are also used to a large extent.

The best protective process for aluminum alloys has not yet been determined. Good results are being obtained with bituminous paints, spar varnish, both clear and pigmented, special hardening greases, chemical coatings such as the Jirotka process,* electrolytic coatings such as the Anodic oxidizing process,† caustic dip processes,‡ cellulose lacquers and various other finishes. Most common use is made at present of the

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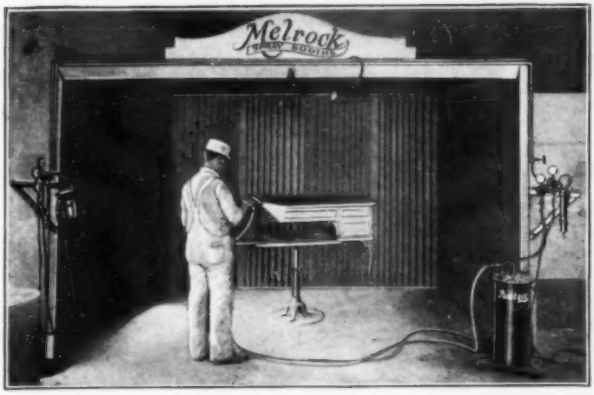


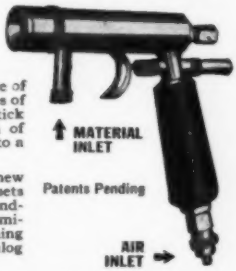
Patents Pending

Melrock SPRAY BOOTHS with Pneu-Gun ATOMIZATION

For more than thirty years—long before the introduction of spray-finishing—Mellish-Hayward Company has been recognized as one of the country's foremost authorities on ventilating problems. To the development of the Melrock Spray Booth, therefore, has been brought a wealth of highly specialized knowledge which has resulted in a ventilating or spray exhaust cabinet that may well be called a "Master Creation."

Something New was Really Needed—The defects of other booths have been eliminated in the Melrock. The baffle plates are so scientifically arranged as to form a uniform suction of air across the entire face of the booth, and collect *all* the fumes, gasses and particles of spraying material. Practically nothing gets through to stick to fan or motor. There are no back drafts. Health of operator absolutely safe-guarded. Fire hazards reduced to a point that lowers insurance rates.

Why the Pneu-Gun is Better—The Pneu-Gun's new atomization system produces a perfection of finish that sets a new standard. Does the finest and most beautiful blending and shading. Always reduces and many times eliminates rubbing. A light touch on trigger regulates finishing stroke from a line up to ten inches. Write for Catalog 101.



The MELLISH-HAYWARD Co.
Manufacturers *Established 1894*
211 W. AUSTIN AVE. CHICAGO, ILLINOIS

The only spray equipment manufacturer that maintains a school for good finishing. We understand your problems

bituminous paints, and aluminum varnish enamels.

Information from Tests

An extensive test carried on jointly by the Glenn L. Martin Co., and the Aluminum Co. of America has been in progress since May, 1926, in New York harbor to determine a suitable protective coating for aluminum alloys.

A fact demonstrated during this test is that painting of parts before joining them together greatly prolongs the life of the metal at and near the joint. This is very interesting to manufacturers of aircraft because of the modern tendency toward structures made of riveted aluminum structural channels and angles.

Wood Finishing

Although the use of wood in modern airplanes is decreasing, wood finishing still plays an important part. Spruce, ash, maple, birch, together with mahogany or birch plywood are the most common woods used. The surfaces are usually prepared for finishing by planing or sanding, followed by one coat of liquid filler. Inside parts are finished with two coats of clear spar varnish and outside parts with three coats of clear or pigmented varnish.

All varnish is sprayed, using about 60-lbs. pressure. Little attempt is made to rub the finish down, as few wood parts of the structure are visible, and the chief purpose of the coating is to protect the wood and maintain its physical properties. Tests on the number of coats indicate that two coats give 76 per cent protection from moisture, while three coats give 83 per cent. The fourth coat shows only 3 per cent gain.

When wood is used for the frames of hulls or pontoons for seaplanes, the wood is frequently finished with two coats of black bituminous paint, the first coat thinned down 25 per cent. The bituminous paint is an excellent protection for these wood parts which are frequently wet.

(To be continued)

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*Refer, the Otto Sprenger Corp., 183 Madison Ave., New York.

†Refer, Aviation Magazine, June 13, 1927.

‡Refer, The Aluminum Co. of America, New Kensington, Pa.

More detailed information may be obtained from:

Circular No. 296, Scientific Section, American Paint & Varnish Mfgrs. Assoc.

"Corrosion" by M. G. Kopf, of J. B. Ford Co., Wyandotte, Mich.

Circular No. 80, Bureau of Standards, Washington, D. C.

Tech. Note 181, Forest Products Lab., Madison, Wis.

"Aero Dopes & Varnishes," The Industrial Chemist, Mar., 1927.

Brushing Lacquer

One of the well-known manufacturers of brushing lacquer submits the following directions to be observed when using brush lacquers:

"The surface to be finished with brushing lacquer should, in all cases, be perfectly clean, thoroughly dry and free from all trace of oil, wax, furniture polish, etc. If the old finish is badly cracked or checked, it should be carefully sandpapered before lacquer is applied.

"Because of its extreme quick-drying characteristics lacquer cannot be brushed as much as varnish or enamel. A fairly heavy coat should be flowed on as evenly and as quickly as possible, brushed lightly and allowed to dry. The first coat will sometimes show a few brush marks, but the second coat levels up perfectly, leaving a surface of un-

balanced

Photo by Underwood & Underwood

The Value of Balanced Finishing

Every successful thing in nature is balanced. If the rope walker, pictured above loses his balance he falls—if a line of furniture is not balanced, structurally, it will fall.

Furniture, however, will fall in the final sales analysis if the finishing is unbalanced. Furniture—to be successful (from standpoints of sales and service) must be balanced as to finishing.

In the Studio Service Department of the Grand Rapids Varnish Corporation there has been prepared a series of programs of balanced finishing schedules, systems and formulas that will spell success for the manufacturer who will use them. It will be well worth your while to investigate! Write!

Gravarco Products

Grand Rapids Varnish Corporation

Main Office, Studio and Factories at Grand Rapids, Michigan

usual smoothness and one that is entirely free from all brushing imperfections. Allow from 20 to 30 minutes between coats for drying."

News of Gilding Wheel for Finishers

A small and ingenious tool for spreading narrow strips of gold leaf, is illustrated in the accompanying cut. The roll of paper-backed gold leaf is mounted on a center pin inside the hinged metal casing and arranged to unwind from the lower part of the tool. The paper backing winds up on a small felt-covered roll while the gold leaf lays on the surface over which the tool is rolled, as shown in the cut.

According to the manufacturer's directions, "the winding of the paper on the felt covered roll entirely governs the perfect working of the gilding wheel, and is

Using the gilding wheel.

regulated by turning the adjusting thumb screw to the right to wind tightly, and to the left to wind loosely. Adjust this tension properly before you commence to use the gold leaf.

"The empty paper winds around the felt-covered rolls as fast as the gold leaf is stripped from it. Bear down with an even pressure upon the surface you are gilding and do not tip the machine to one side or the other, as this may prevent all the gold leaf from leaving the paper. Do not press down very hard on the surface to be gilded, merely using sufficient pressure to revolve the wheel and prevent it from slipping on the work.

"If the paper does not wind evenly on the felt-covered roll and runs off to one side be sure to adjust it before going ahead with your work. If it is in a very bad condition, remove the empty paper from the felt-covered roll and start all over again. If the leaf should stick to the wrong side of the paper merely, blow it down onto the right side and it will run all right.

"When gilding with aluminum leaf or imitation gold leaf, use a very strong size and gild sooner, as a stronger tack is necessary than for XX deep gold. Wearing body varnish, tempered so as to dry in two or three hours, with japan gold size and a few drops of boiled oil, makes the best size to use for work which is to be varnished over. This size can be quickened by leaving out the oil and adding more of the japan."

Wheels are made in widths of $\frac{3}{16}$ to 5-in. These tools are a product of the W. H. Coe Mfg. Co., 89 Ship, Providence, R. I.

In many lines, production capacity is in excess of market requirements, forcing an increase in the intensity of competition and a consequent reduction in selling prices. But wages continue high and there is small prospect of any reduction in this direction. As a result, if profit margins are to be maintained, operating effectiveness must be steadily improved. Every manufacturing executive must be continually on the alert for every new way, means, method and device, to do work better, faster and cheaper.

!

A most unique and distinctive finish!

Pioneered as a leatherette finish for radio horns, its variety of attractive combinations has brought it into use for many other articles, such as radio cabinets, furniture, fixtures, novelties, toys, etc.

Ease of application—uniformity of pattern—combinations to suit your particular requirements, are outstanding qualities of BREVOKRAK.

Thorough-going demonstration made at your plant if desired.

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WAUKEGAN, - ILLINOIS

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BREVOLITE lacquers and lacquer enamels for the wood finishing trade are hard wearing, good covering materials.

Broom Handle Finishing—Lacquers

Describing some of the materials, methods, equipment and colors employed by certain manufacturers of broom handles

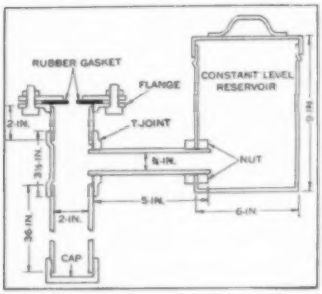
By J. C. Alsee

THERE are several types of broom handle finishes as well as several methods of finishing broom handles. The type of finish in vogue today is lacquer, and the finishing is usually done by the "rubber gasket or squeegee method." It is this type of finish and this method of finishing that the writer will describe elsewhere in this article.

In the past, the general type of finish used has been "shellac or substitute shellac." This shellac was of a clear or transparent nature. Later on, as colored broom handles became popular, dyes and pigments were incorporated. This effect, while imparting the color touch, did not produce the opaque finishes of present day lacquer enamels.

Shellac Finishes

The system of finishing broom handles with shellac or substitute shellac has been (in addition to the straight gasket or squeegee method, which is described elsewhere in this article), by machine, in which the handles were run through a gasket device. These handles were coated five or six at an application, and in a horizontal position.



This cross-sectional view of single dip tank and lacquer reservoir shows typical squegee dipping apparatus.

This method, because of the great speed involved in forcing the handles through the rubber gasket or squeegee, necessitated from two to eight coatings of the shellac or substitute shellac. The faster the handles are forced through the rubber gasket, the smaller is the deposit of liquid on the handles. Shellac and substitute shellacs are still used today, but I believe they are not as popular as the nitro-cellulose lacquer finishes.

Oil Enamels

Oil enamels have also been used and are still in use at the present time. These oil enamels are used mostly as an undercoat for lacquers. The white oil enamel is used to a greater extent than the colored oil enamels. This is due to the fact that a white-broom-handle lacquer enamel (especially when used over the harder woods) did not produce the necessary covering power.

The one draw-back in using oil enamels is that it takes a longer period for them to dry. To produce the high lustrous effect of a straight nitro-cellulose lacquer

Announcement
of New Color Harmonies for Maple

IN cooperation with the Maple Industry we are publishing new finishing specifications embodying a recently developed series of Marietta Stains, finished with the well known American Lacquer and Varnitro.

These specifications were adopted as official by The Maple Flooring Manufacturers Association on July 20, 1927.

Panels showing the gorgeously hued effects obtained with these new Marietta Stains may be secured from the above Association, 332 South Michigan Ave., Chicago, Ill., or from

The Marietta Paint & Color Company

MARIETTA, OHIO — MARIETTA WOOD AND METAL FINISH SPECIALISTS — HIGH POINT, N. C.

schedule, this white oil enamel is top coated with a clear water white lacquer. This clear lacquer may be of the same body as the oil enamel or may be used in a reduced state, but it must be reduced only with the proper reducer, as recommended by the manufacturer of the lacquer. It is essential that the clear top coat be of such a nature as to produce the desired results in the one application.

This clear top coat must be applied as quickly as possible; the handle coated with the oil enamel must not remain in the clear lacquer top coat very long. The tendency of the clear lacquer must be of such a nature as to minimize the softening and the picking-up of the undercoater.

Lacquer Finishes

The nitro-cellulose lacquer finishes on broom handles today are far more durable than shellac, substitute shellacs or oil enamels. The finish outlives the broom itself in most cases, and will not peel off when the broom is being used, as do some of the shellac finishes. Nitro-cellulose lacquer finishes produce uniform coatings on handles and dry very quickly.

The lacquer or lacquer enamel is of a very heavy body, almost of a putty or paste consistency. This lacquer or lacquer enamel is usually used at this consistency, but is sometimes reduced in various proportions with the proper reducer. The amount of reduction varies from 10 to 25 percent. The lacquer or lacquer enamel representing a type of material having sufficient solids, namely oils, gums, etc., is the proper type of material to use.

If the lacquer or lacquer enamel is lacking in the necessary solids, the deposit on handles that are drawn through a rubber gasket or squeegee, will be uneven and certain spots may be bare. Two or three coats of the material should produce the desired results. One-half hour air drying should be given between applications.

There are several types of woods used for broom handles—pine, spruce, hemlock, birch, etc. Pine wood is commonly used. When the softer types of woods are used, it is always advisable to use a first coater of clear lacquer. This clear lacquer acts as a sealing coat and prevents the absorption of the lacquer or lacquer enamel by the wood.

This first coater may be a shellac or substitute shellac, or it may be a clear nitro-cellulose lacquer. This sealing coat may be of the same body as the finishing material, although better results may be obtained if the sealing coat is reduced about 25 percent. At this reduction, a more even coating of the material should be obtained.

A Dipping Outfit

An easily-constructed dipping tank for broom handles is illustrated in the accompanying drawing. The bottom of this dipping chamber (made of an iron pipe) consists of a threaded screw cap, which can be removed to permit a thorough cleansing of the dipping chamber when necessary. Near the top opening of the main iron pipe, a tee is inserted and connection is made with a constant-level material tank, as shown in the drawing. This material tank is cylindrical and is fitted with a lid to lessen evaporation.

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On the top of the main pipe or dipping chamber, there is a flanged lip over which is fitted the rubber gasket of the proper hole width. These rubber gaskets may be secured in any desired degree of hardness and may also be obtained singly or in series of three and six. Over the rubber gasket is placed a flat iron ring which has two holes for the insertion of bolts to secure it to the flanged lip.

This dipping device can be placed in a hole provided for it in the floor of the dipping room, its position being such that the top opening, where handles are inserted, is about a foot above the floor. At this distance, ideal results are generally obtained.

All operations are by hand and care should be exercised in withdrawing each handle so as to get an even coating all over the surface. Attention must be directed to seeing that the rubber gasket is not left to harden in the dipping chamber. The gasket should be used constantly, with as little delay as possible. When changing from one color to another, it is essential that the container be thoroughly cleaned by first allowing thinner to soak for awhile and then dismantling the chamber.

The colors in vogue today for broom handle finishes, are clear, natural, white, red, blue, purple and canary yellow.

Prefers Lacquer Tough

Lacquer is different from other finishes in many respects, but there is one characteristic of a good wood lacquer that I particularly like. That is the fact that it is not brittle.

Of course, the argument can be advanced that a lacquer does become brittle with age, but this is true mostly of the cheaper grades of lacquer or of those that are not properly balanced as to solid and solvent content. However, a high grade lacquer, made for durability, cannot be easily marred. But when it is, you will find that the finish has not been broken through. A good durable lacquer, made for wear, is so flexible and tough that sometimes you must press very hard with a sharp tool in order to damage the finish.

It is often stated that a tough lacquer is one that contains so much nitro-cellulose that it is very viscous and therefore not a practical wood finish. Perhaps, from the standpoint of the finishing room, this lacquer is not the nicest type of material to work with, but after it has once been put on the furniture it is there to stay and will stand a great deal of abuse.

I am in favor of using the toughest grade of wood lacquer that can possibly be made, for then we get the utmost advantage of the modern pyroxylin wood lacquer.

In other words, I cannot see much advantage in the use of wood lacquer unless the very best grades are used. Of course, there is always the time element to be considered, but that is about the only advantage in using a cheaply constructed wood lacquer.

I would far rather use a good grade of rubbing varnish than a cheap brittle wood lacquer, but I would still rather use a high grade wood lacquer than a high grade rubbing varnish.—J. C. Hertstein, Jr.

A
Century's Experience
in Solving the problems of Industrial Finishing

DURING the past 95 years, Valentine & Company have been privileged to work with many different industries in solving a great variety of difficult finishing problems.

Because of this fact a wealth of experience has been acquired, together with an intimate knowledge of finishing, that makes the solution of new problems less difficult.

Any manufacturer who is faced with lacquer or varnish problems, is invited to avail himself of the knowledge and co-operation of the Valentine Staff.

VALENTINE & COMPANY
456 Fourth Avenue, New York

NITRO-VALSPAR

The *Valentine* Lacquer Finish

"In the plant where I am employed as finishing foreman we have 436 different finishes—some acid, some polish, some enamel, and most of bronze powder finishes."—
August L. Medel

Mixing Bronze Powders

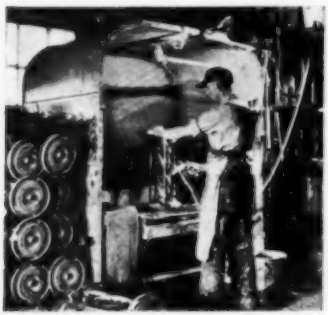
Experienced foreman finisher explains how to measure and mix bronze powders to match sample colors, how to make tests, and how to change the shade or luster of a bronzing finish

By August L. Medel

BRONZE powders are intermixed to get any desired shade or color — the same as any enamel — but unlike enamels, bronze powders are mixed in their dry state. One must have a good eye for colors so that by looking at a sample color, he can almost tell just what kind of bronze powders are needed to match the color of the sample.

Measure With Teaspoon

The best method I know of is to measure the powder with a teaspoon. The color mixer will have pencil and paper at his mixing table and, as he takes a level teaspoonful of powder, he marks a figure one or a line alongside the name or kind of powder he has just used.



Finishing lawn mowers in attractive colors, which include bronze and aluminum effects produced through the use of bronze powder finishes.

When he thinks he has all the powders in correct proportion in the batch and believes that the color is correct, he mixes them thoroughly and pats down a portion—not leveling it but merely running the mixing tool from left to right just to press it down. Then he holds the sample alongside to see if the color really matches. If it seems to be right, the next thing he does is to try the powder in the usual way.

Making a Test

The expert mixer takes some flat pieces of brass or iron, and, after mixing the powder in a suitable bronzing liquid, he sprays the finish on them. When the finish is dry he compares the surface with the sample color. This test will readily show whether the preparation is correct, or off color. If it doesn't match perfectly, an experienced mixer can easily tell what the batch needs to make it the same as the sample.

Once a man has made a record of the quantities of powders used (a formula) to produce the specified color, this record can be kept for future reference and the same

"Eliminate a Fire Risk"

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SYPHON VENTILATED CABINET

THE "NEWCOMB" GIVES YOU everything you could want in a spraying cabinet and much more than you had thought possible.

Let us tell you about our latest and best development; the fan with direct connected motor, independent of booth, with rear of booth fitted with reclaiming chamber and baffle-doors.

Grand Rapids Blow Pipe and Dust Arrester Company

Dust Collecting Systems 527 Monroe Ave. Grand Rapids, Michigan

What has the Fresno Fire Department got to do with "INDUSTRIAL FINISHING?"

IF you read the letter, you will note *three* things:

(1) Egyptian Lacquer goes on any surface quickly, easily, successfully, and by comparison to less successful finishes, inexpensively. (Note paragraphs 1, 2, 3, 4.)

(2) Egyptian Lacquer, after it is *on*, has the appearance and quality that causes people to be "particularly pleased" and "thoroughly satisfied with the results." (Note paragraphs 2, 3, 4.)

(3) Egyptian Lacquer "is particularly valuable . . . because of the fact that oil, sulphuric acid, nitrin, etc. does not spot it, or apparently affect it in any manner." (Note paragraph 5.)

Egyptian Lacquer regularly comes clear, transparent colored, and in 140 shades of pigmented lacquer enamel. Our Service Department—backed by nearly half a century of experience with lacquer *exclusively*—will be glad to cooperate with you on any problem, or make up for you any special "prescription."

EGYPTIAN Lacquer

THE EGYPTIAN LACQUER MFG. CO., INC., 90 West Street, New York

Completely equipped branches in charge of practical men *are maintained in the following cities:*

ATLANTA, BOSTON, CHICAGO, CLEVELAND, DALLAS, DETROIT, LOS ANGELES, PHILADELPHIA, PORTLAND, ORE., SALT LAKE CITY, SAN FRANCISCO, SEATTLE, ST. LOUIS

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ST. LOUIS

CITY OF FRESNO

FRESNO, CALIFORNIA

Egyptian Lacquer Co.,
50 Main St.,
San Francisco, Calif.

Dear Sirs: Attention: A. E. Thompson

Further, with reference to our conversation of the other day, it is a pleasure to give you an outline of our experiences with Egyptian Lacquer in the Fire Department Red.

We have painted 3 cars, 1 Chief's cars and one 50 foot City Service truck with Egyptian Lacquer and we are thoroughly satisfied with the results.

We are particularly pleased with the body and finish of the lacquer and believe that gradually the Fire Department Officials will recognize the value and merit involved and will come to consider this the only type of material to use in painting fire apparatus. We usually turn out the best jobs that we do in five days from the time the apparatus comes into the shop until it is back on duty.

We are particularly pleased with the lacquer when a repair job is involved. Shortly after one of the pieces of equipment painted by us was placed back in service it was involved in a collision with a street car resulting in, among other things, a smashed front fender. The fender was removed from the car, rolled out and the section of it on which the paint was damaged was built up and the finish blended in to the rest of the lacquer so satisfactorily that it was impossible to tell where the patch was.

We believe this type of material is particularly valuable to the Fire Service because of the fact that oil, sulphuric acid, rain, etc. does not spot it or apparently affect it in any manner. We will be glad, indeed, to answer any additional inquiries with reference to our success in this matter.

Yours very truly,

Chief Engineer Fire Department.

EGYPTIAN SUPERIOR LACQUERS

Write the New York office for new booklet "Egyptian Lacquers for Machine Tools." Yours on request.

National Advertising

Egyptian Lacquer is being nationally advertised to your customers and prospective customers in The Saturday Evening Post . . . It is a sound selling argument to say, "This is finished with Egyptian Lacquer."

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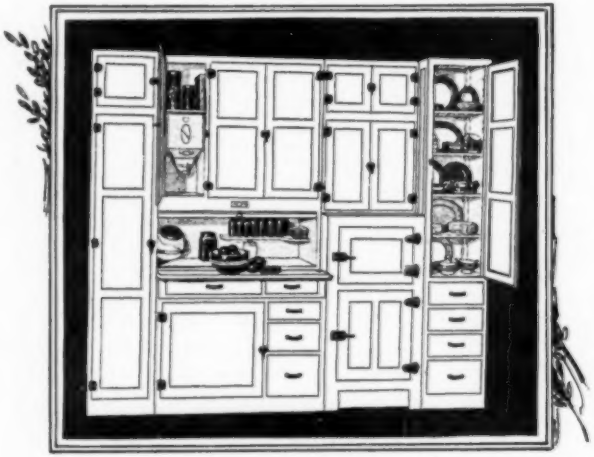

..... *there you will find* PECORA CUTICLE ENAMEL

Many manufacturers of kitchen cabinets, tables and stoves; refrigerators, bath tubs, hospital equipment; and all other products finished in white; who wish to offer guarantees against their products turning yellow, have learned from experience that they can do so in safety when using our Cuticle Enamel.

The dependability of this product has won it a host of friends all of whom are staunch boosters—When are *you* going to try it?

PECORA PAINT COMPANY

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Established 1862 by Smith Bowen — Philadelphia, Pa. — Incorporated 1911

Kindly mention INDUSTRIAL FINISHING when writing advertisers

color can be exactly duplicated at any time. I would not advise measuring powder by weight, as bronze powders vary in this respect; some are much heavier than others.

When mixing powders on a large scale, a mixing barrel can be used to good advantage.

Different Shades and Luster

One can get different shades for one batch of powder; it all depends on the amount of powder used in the solution. By adding one and a half level teaspoonfuls of powder to a pint of liquid, the finisher will get a darker shade but much more gloss than he would get by adding four level teaspoonfuls, which gives a more solid color.

Sometimes the use of less powder in the solution saves an extra operation of spraying the article with clear gloss lacquer.

To produce a good silver powder, mix four level teaspoonfuls of brush brass bronze powder to seven level teaspoonfuls of aluminum powder and use four level teaspoonfuls to a pint of the liquid.

A good bronzing liquid can be made by mixing one pint of any good spar varnish with one pint of turpentine. This makes an excellent medium for hand decorated work.

When an extra high gloss is desirable on any bronze powder finish, the use of spar varnish will give beautiful results.

Note by Editor: Mr. Medel has sent us some samples of his work in matching finishes of sheet metal. For example, the surface of a thin sheet of iron, colored by heat treatment to a dark blue gray, has been matched perfectly with a bronze powder finish sprayed upon a sheet of yellow brass. Half of the finished sample has been left in the dull finish, which matches the heat treated sheet of iron, and half has been glossed with spar varnish to produce a high luster finish.

In his letter Mr. Medel says: "I will also match any sample of bronze powder finish you require to help out your questions and answer column, or any statuary-bronze finish that is made on a sand blasted surface (not on a buffed surface)."

Lacquered Rugs

One of the largest manufacturers of felt base rugs is now finishing his product with a nitrocellulose lacquer. Tests of rugs finished with this material indicate that they are three times as durable as felt base rugs without lacquer. At a recent civic event in Cincinnati, a lacquer-finished rug was subjected to a severe test. Sixty-five thousand persons by actual count walked over it, but practically no evidence of wear was perceptible.

Ease of cleansing is an added feature of this new type of rug. Dirt and grease may be removed by washing with soap and water without in any way affecting the finish. The new rugs are available in a variety of attractive color effects and designs suitable for every room in the house.—News.

In the finishing room, even though exhaust fans are provided, provision must also be made for supplying fresh air for ventilation.

Industrial Finishing

PRACTICAL PUBLICATIONS, Inc.
Publishers
Room 603, 222 E. Ohio St.
Indianapolis, Ind.

Issued monthly. Distributed exclusively to executives and foremen finishers in all kinds of industrial plants where finish coats are applied.

EDITORIAL

Finishes Help Sell Product

What distinguishes one article from another, in point of utility, quality and appearance, is what sells it—or fails to sell it. Buyers are interested in "the best value" for the money. Today, the surface finish plays an all important part when the buyer is judging values, especially when that article is one which will be seen by others after the buyer has purchased it.

Recognition of this fact has prompted a number of manufacturers to give special attention to the finish on their products, and then to feature the attractive finish as an outstanding sales appeal. For example, the manufacturer of a certain base-board register, in its advertising directed to the building contractor, stresses the finish very strongly.

Among other things we read in the advertisement, "The new line of finishes in which 'T & B' registers are offered has proven a real sales factor. They make the register an additional touch of beauty to the room in which it is installed. Furnace men know what this means to their customers, consequently they choose the 'T & B' line. Dealers who have not investigated Tanbo and other exclusive 'T & B' finishes are losing time—and profits. Our annual catalog has just come off the press. It shows actual 'T & B' finishes and a mint of other valuable information."

It is probably safe to say that thousands of manufactured products only need the magic touch of color, plus a durable finishing material, to give them a striking appeal which will arrest attention, excite interest, compel admiration and result in volume sales. Manufacturers are urged to respect the importance of the finish, as it wields a powerful influence in today's and tomorrow's competition.

Larger Volume of Sales in Finishing Materials

At a recent convention of the Paint and Varnish Division of a nationally known manufacturing concern, it was brought out that during the past six months the sales of the districts represented at the convention showed an increase of 17 per cent over the corresponding period of last year.

In the paint prescription service which is a new help for customers in the industrial field there was an increase of 56 per cent during the first six months of 1927 over the corresponding months in the previous year. This is a service which is now extending to all parts of the country and has in its employ, skilled engineers who are able to discuss the qualities of paint and varnish as applied to industrial establishments from an entirely new point of view.

The coverage of brushing lac-

QUICK-LAC

cuts your costs

in HALF!

You can get the best shellac results with Quick-Lac at just half the cost.

Quick-Lac is a new process first coating varnish perfected by the Boston Varnish Company and manufactured principally for use on furniture.

Quick-Lac dries hard and is ready for sanding in 5 hours. It sands as effectively and easily as pure shellac, and can be applied twice a day as a building coat. Yet it costs only half as much.

Special Offer!

Send for sample barrel of Quick-Lac today. We make this special offer: Use 5 gallons of Quick-Lac and if you are not more than satisfied with the results, return the barrel at our expense. Write to

L. E. SHARPE
612 Division Street, LaPorte, Ind.
Middle Western Representative

Boston Varnish Company

872 Everett Station **Boston, Mass.**

quer in towns of more than 1,000 population, it was reported showed an increase of 84 per cent as compared with 77 per cent for last year. There was reported also a large increase in the business of the architectural division.

Directory of Testing Laboratories

In accordance with law the National Bureau of Standards makes tests and carries out investigations for other Government departments. Due to the large amount of this official work it is impracticable for the bureau to make tests for private individuals if other laboratories can do the work.

To inform interested persons of the location of other laboratories, the bureau has compiled a list of the 207 commercial testing laboratories throughout the country, together with indications of the types of commodities which they are prepared to test. There is also presented a list of laboratories of 143 colleges which are used not only for purposes of instruction but also for research work.

An outline is given of the certification plan in accordance with which there have already been compiled 48 lists of manufacturers who have expressed their willingness to certify to purchasers that material supplied on orders based on the indicated 48 U. S. Government master specifications complies with the requirement and tests of these specifications. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 15 cents each.

Steel Furniture Volume

According to a recent Department of Commerce bulletin, July shipments of steel-furniture stock goods, as reported by 33 manufacturers in the "business group," were $2,091,804 as compared with $2,519,512 in June and $2,149,546 in July, 1926. July shipments of shelving, compiled from the reports of 15 companies, were $534,592, as compared with $657,927 in June and $531,361 a year ago.

A compiled table shows that new orders for steel furniture during the first seven months of 1927 amounted to from two million to three million dollars monthly, with a total of 18¼ million dollars worth for the seven-month period. Shipments averaged about the same. Monthly unfilled orders amounted to from 1½ to 1⅘ million dollars worth. New orders for, and shipments of shelving each totaled 3⅘ million dollars worth for the first seven months of 1927.

SUPERIOR WOOD STAIN POWDERS

For Lacquer and all finishes.

Complete variety of shades. Samples and information on request.

W. D. LOCKWOOD & CO.
314 W. 14th St., New York

Dependable
WOOD LACQUER

Made Since 1857
At our works—Newark, N. J.
Pioneer Lacquer Manufacturers
CHAS. COOPER & CO.
90 Worth St., New York---Works Newark, N. J.

Get This Straight-

If you are looking for cheap lacquers, made on a price basis only, do not investigate Rockford Varnish Company products farther. They will not fill the bill.

Our lacquers are the best that we can make—neither time nor money have been stinted in bringing them to their present state of perfection. There may be other lacquers as good—but we know of none that are better. They do a splendid job—one that lasts—with a minimum of labor in applying.

But—get this straight—if you want a lacquer that does a real job—that gives customer satisfaction—send in a trial order today, and let the product prove its merit.

"No Tampering with Quality"

The
ROCKFORD VARNISH
Company
ROCKFORD, ILL.

Chicago Auto painter calls attention to present prices of refinishing and describes in detail the sequence of operations on four price classes of paint jobs, doing the work effectively economically and profitably

How to Refinish Automobiles Profitably

By L. A. Johnson

THE PAINTING of automobiles has been slowly changing for the past ten years, but the greatest changes have taken place in the last two or three years. This is due, in part, to the fact that automobiles can be bought so cheaply. Today the average new car sells for about $1,000, while used cars can be bought for as little as $150. Compare these figures with the prices of a few years ago, and you see that they are about one-third less. Naturally, this is affecting the custom-paint shop.

A few years ago, paint shop owners got $200 to $375 for a paint job. If you ask that much now you get the laugh, but not the business. Today, the automobile refinisher must be prepared to quote lower prices, but even so, money can be made doing this work, if it is done the right way.

This article outlines the system I have followed for some time, and which has brought both profits and added business to the shop. The jobs are divided into four classes. The first class includes cars being conditioned for resale, and for the type of owner who says, "I am going to sell this car in a couple of months, so just shine it up a little bit." Prices for such jobs range from $30 to $45 for open cars, and $35 to $50 for closed cars. I wouldn't advise anybody to take cars any cheaper.

For Class No. 1 Jobs

If the old finish on the car is badly checked, remove all of the paint; if not, sandpaper the body and hood with No. ½ flint sandpaper. Use No. 1 sandpaper on fenders, pans, etc. If the car is greasy, wash it off with benzol. Care must be taken to have car free from grease or polish. Spot putty all places that need it. Now give the entire car a heavy coat of sand surfacer.

The chassis and wheels can be cleaned, and the chassis painted with asphaltum cut with gasoline. Leave car stand over night. Next morning sandpaper the entire car, including top bows and windshield brackets, with No. ½ flint sandpaper. Dust with duster and wipe with a clean cloth. Color

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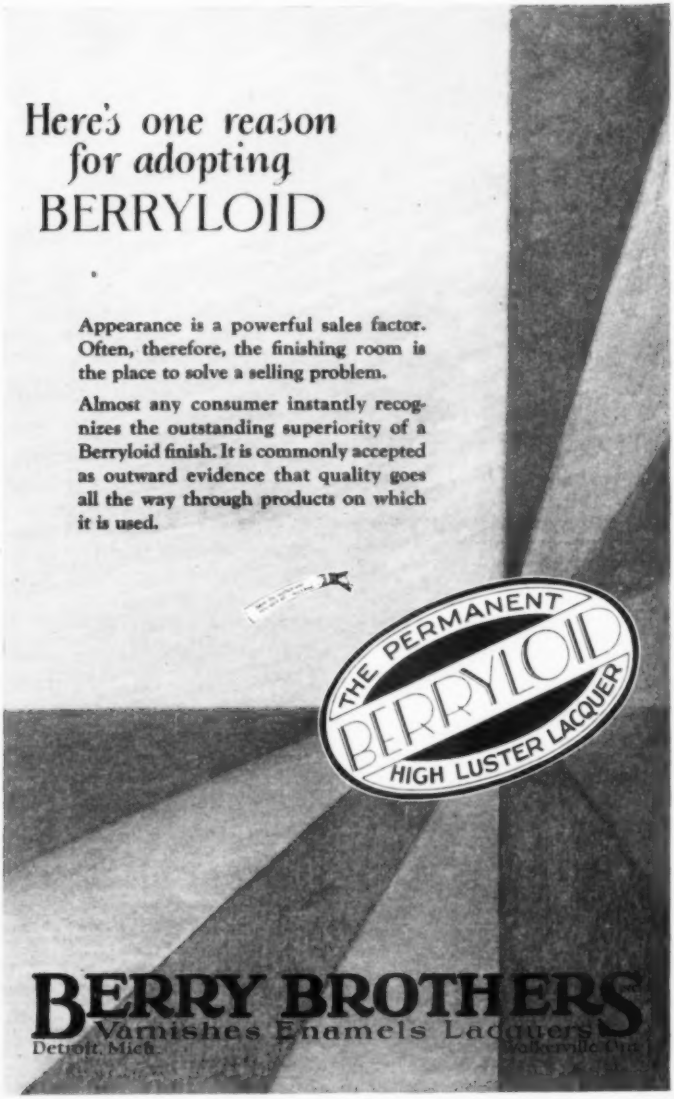

Here's one reason
for adopting
BERRYLOID
Appearance is a powerful sales factor. Often, therefore, the finishing room is the place to solve a selling problem.
Almost any consumer instantly recognizes the outstanding superiority of a Berryloid finish. It is commonly accepted as outward evidence that quality goes all the way through products on which it is used.
THE PERMANENT
BERRYLOID
HIGH LUSTER LACQUER
BERRY BROTHERS
Varnishes Enamels Lacquers
Detroit, Mich.
Walkerville, Ont.

out body and hood, using japan color thinned with pure turpentine. I use well-known, advertised japan colors. While waiting for the body to dry, paint the top bows, windshield, etc., with black enamel. If the car has disc wheels, color out same and carry along with body.

When body is dry, give entire car—body, fenders, pans, radiator and gas tank—a coat of pure white shellac cut about 50 per cent with denatured alcohol. This can be brushed or sprayed. Care must be taken to keep brush marks out of job. The car will be dry in about ten minutes. While waiting, dress the top, using black asphaltum cut with gasoline. Sandpaper the body and hood only with 4/0 flint paper. Wipe surface with cloth. Add about a teaspoonful of rubbing varnish to color, and color out body and hood.

Touch up bare spots on fenders and along the body on the fenders and pans with drop black thinned with turpentine. If you are not using a solid-covering, black, fender enamel, color entire fender. Black off the mouldings. As soon as it is dry, the car is ready to varnish. While waiting, run car into the finishing room, jack it up and knock off any loose paint on wheels, and give each wheel a coat of shellac. It is not necessary to remove the tires.

When brushing on shellac, use a 2½ or 3-in. ox-hair brush, and for color, use a 3-in. camel-hair brush. When shellac is dry, apply color varnish to the wheels, using finishing varnish instead of rubbing varnish. Use about 25 per cent of color with varnish so the wheels will be covered solidly. A 2-in. camel-hair brush is best to use on wheels.

When body is dry, sandpaper the entire surface with No. 4/0 paper. Sandpaper lightly to avoid sanding through to bare metal on sharp corners, etc. Tack off the entire car and varnish with a heavy-bodied clear varnish on the body. Use black fender enamel on the fenders. When putting on these finishing coats, flow on a good heavy coat and do not brush much; keep your brush out of the corners and you will make a cleaner job.

Next morning stripe the car, paint the door jambs, clean the glass and running-boards, paint the rims, and to add a neat appearance to job, dress the tires. Dry lampblack, thinned with gasoline, and a little black enamel added makes a good tire dressing. The car is now ready to deliver. Remember this: That cleaning up the car for delivery is an important part of the work. A car neatly trimmed up brings more jobs to the shop.

Class No. 2 Jobs

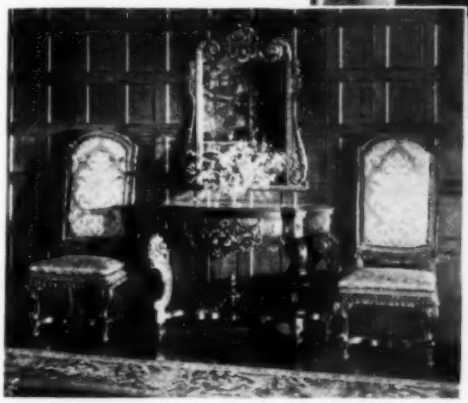
Class No. 2 jobs range in price from $45 to $65 for open and $50 to $70 for closed cars. Proceed the same as in class No. 1, but omit shellac on body. Give the body and hood one heavy coat of color varnish and leave it stand over night. Next morning scuff off with No. 280 wet or dry sandpaper, using oil cut with a little gasoline.

Wipe off the surplus oil, paint the bows, windshield, etc., and shellac the fenders, pans, wheels, etc. Touch up any parts that may be rubbed through with flat color. The car is then ready to varnish the same as in a class No. 1 job.

Class No. 3 Jobs

Class No. 3 jobs range in price from $65 to $100, both open and

This is the luxuriant private car of one of the wealthiest men in the United States . . . and the interior is finished with Thresher's varnish



The same varnish used on the above car is ideal for such magnificent furniture as this

Although our varnishes are being used extensively on fine railway coaches, sleepers, diners, parlor cars, etc., they have never been exploited particularly for furniture finishing. We are taking this means of announcing that they are unexcelled for finishing of high grade furniture or any other product that justifies a really fine finish.

The best deserves the best—why use an inferior varnish or finishing material on a super product. Our varnish is not for cheap or production products—If you make the best—then we solicit your inquiry.

THE THRESHER VARNISH CO.

DAYTON, OHIO

VARNISH——ENAMEL——LACQUER

closed models. Proceed as in class No. 2. If job has been burned off, give car a prime coat, using 50 per cent black fender enamel and 50 per cent pure turpentine. This must stand over night. Give body one coat followed by a coat of clear varnish. Color varnish the tops of the fenders only.

When dry give body, hood and tops of fenders an oil sanding, taking more pains with this operation than in a class No. 2 job. Wipe off surplus oil and wash up, using a clean sponge and water with about two cups of gasoline to a pail of water. Keep sponge pretty dry and wipe up as you go along. Let stand about 30 minutes till dry. Shellac side pans, front fenders, skirts, and gas tank. Take a small brush dipped in shellac and run it along all cracks, etc. Tack off and finish, using a lighter-bodied varnish on body and hood, and black enamel on fenders, etc.

Class No. 4 Jobs

Class No. 4 jobs are priced from $100 upward. Proceed as in class No. 3 job, giving body and hood two coats of color varnish and completely color varnish the fenders, pans, radiator, etc.

When dry, give entire car a good rubbing with 6/0 pumice stone on a felt pad and use with water. Clean up as in a class No. 3 job and varnish with same kind of varnish.

Following this system will net the shop owner a satisfactory profit—one which I think is as much as the old-timers made in the so-called "good old days."

Automobile
LACQUERS
Free from gum
Give dependable finish
Established 1857
CHAS. COOPER & CO.
90 Worth St., New York---Works Newark, N. J.

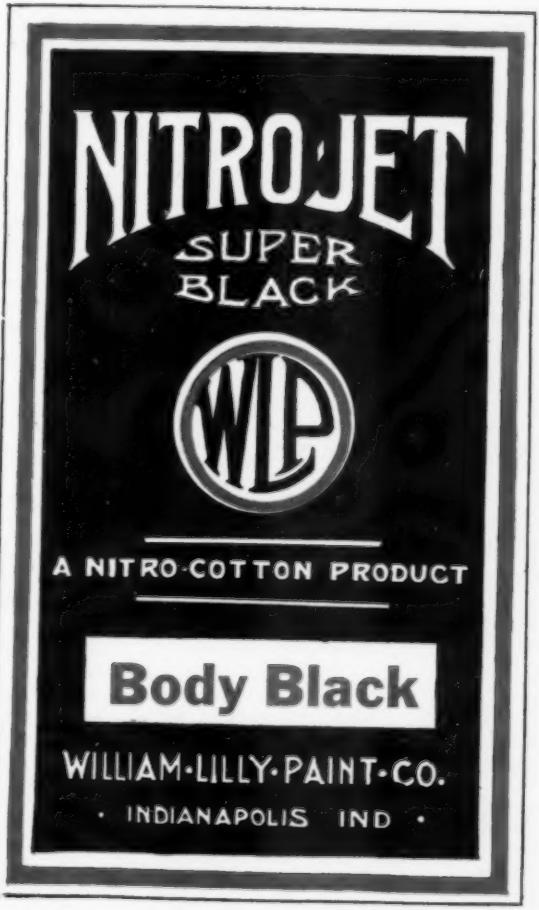
The Industrial Chemist

Recent articles in INDUSTRIAL FINISHING have dealt with the service man, but now comes the industrial chemist of today. Anyone who has had the pleasure of getting in close contact with the latter will have noticed that he is an absolutely different person today than a few years ago.

My meaning is this—that the present industrial chemist is not only interested in the chemical analysis of finishing materials, but in their application also.

Recently I had a pleasant experience in a finish manufacturer's plant. The service man happened to be away on vacation. Some panels were wanted in a hurry. I saw the industrial chemist undertaking the task of finishing the panels, which required staining, filling, spraying, rubbing and polishing, and believe me, dear readers, he in no way discredited himself. He produced some beautifully finished panels! The chemist no longer converses "deep chemistry" with the finisher, which sails way over the finisher's head, but now he uses plain finishing-room language, and this gets results.

A few words of praise must be said of the varnish and lacquer makers, who are not only interested in the making (or, using their own term, "throwing them together") but in watching closely the varied applications of their finishes.—Joseph Cowan.



Clear and Colored Lacquers for Auto, Furniture, and all Industrial Purposes. Quotations and full information on request.

Questions and Answers

This service department is conducted to meet the readers' need for prompt information on specific problems, and to give others an opportunity to review the questions and to offer comments, suggestions or answers

Cleaning Racks for Baked Finishes

I would greatly appreciate any information you could give me in regards to the cleaning of racks used for black japanning and for baking varnish. The racks that are to be cleaned have about 20 coats of varnish on them and each coat is baked at about 430-deg. of heat. We have tried burning the racks in hot lead. This removes the varnish and japan satisfactorily but it is too slow an operation, as each rack has to be burned separately. The burning operation also bends the hooks out of shape.

At present we are using a commercial cleaner in a boiling solution to remove the varnish. This does a good job but the solution does not hold its strength very long and has to be rebuilt too often. Any information you could give in regards to a cleaner would be greatly appreciated.—D. B.

The almost universal method of cleaning baking japan and such materials from finishing-room equipment, such as racks, hooks, etc., is to dissolve baked japan in a strong solution of caustic soda kept boiling hot with live steam.

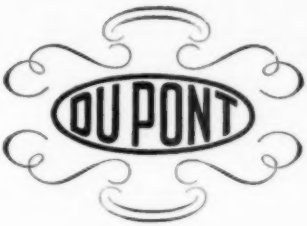
Some of the commercial cleaners consist principally of soda ash which of course is not as strong in the removing action on baked finishes as is caustic soda. A caustic soda solution may be obtained by using about 4 to 6-oz. of lye or caustic soda to the gallon of water. It will be cheaper to renew the solution as it may be required than to handle each hook separately and get it bent out of shape by attemping to burn the old finish off.—R. L. Masterson.

Color Articles Questioned

Since my return from an extended engineering trip, I have been trying to catch up on my reading. In this connection I was interested to read the article by Prochazka in the March issue, on the subject "How Fast to Light are Dyes?" In contrast to this article, is the one written in May issue by S. S. Harkavy. It is rather funny to note that the letter recommends each color which fades the worst—according to Prochazka.

As a matter of fact, the latter has made a poor case, since my 17 years of practical and laboratory experience show conclusively that there is no comparison between wool tables and stains from the same colors applied to wood. In the latter a definite mordanting action takes place, probably induced by the tannic acid prevalent in most woods. As a matter of fact I very much doubt if either man is aware of this condition. —A Research Chemist.

I wish to comment on the recent interview of the research chemist on my article. I distinctively claimed that acid dyes are



Du Pont observes

a century and a quarter of usefulness

to the American People

AN ANNIVERSARY can be either a point from which one looks backward, or a point from which one looks forward. Du Pont regards its 125th Anniversary as a point of *departure, not as a point of arrival.* Du Pont believes that its scope of usefulness calls for no yardstick of years past to measure it, because it is the years to come that will measure du Pont's largest usefulness.

Many new products have been offered to industry for the first time by du Pont. No product has ever been offered until painstaking chemical research has pronounced that product fit to bear the name du Pont.

DUCO · PAINTS · VARNISHES

E. I. DU PONT DE NEMOURS & CO., INC.

"fairly" fast to light and not fast to light. As a matter of fact, very few acid dyes are fast to light, but on the general average acid dyes will meet the requisite where a fair fastness to light is required.

I am glad to see that INDUSTRIAL FINISHING is stirring up the members of the color industry to an argumentive point. This little debate will only lead to our garnering some valuable information about color, and this is a very good objective.—Samuel S. Harkavy.

Waterproof Sandpaper for Furniture and Fixtures

In looking over the July issue of INDUSTRIAL FINISHING, I was interested in reading the article entitled "Sanding between finishing coats." In this, as in several other articles I have read, the author seems to be unfamilar with the fact that there is a waterproof sandpaper for use in sanding coated surfaces with water. As a matter of fact, there are several such. We put one on the market along about 1922, and it is still sold as the original waterproof sandpaper wet or dry. Since that time other leading sandpaper manufacturers have developed waterproof sandpapers sold under other names.

Waterproof sandpaper has practically revolutionized the sanding industry so far as automobile finishing is concerned. I do not think there is a single automobile manufacturing plant or automobile body-making plant where waterproof sandpaper of one make or another is not used. It is also used almost exclusively in the automobile repaint shops around the country.

With the introduction of pyroxylin finishes, the use of waterproof sandpaper with water or with mixtures of oil and water became almost an absolute necessity. It would probably be a difficult thing to find any use of ordinary sandpaper on varnishes or lacquers in the automobile finishing field at the present time.

In view of this fact I was a little surprised to note that Mr. Rottmann speaks of using No. 3/0 or No. 4/0 garnet, double face finishing paper moistened on the back side to eliminate scratching. About the only effect moistening on the back side of double-face garnet finishing paper would have, would be to possibly make it a little more flexible, but in all probability cause it to shed its grit and scratch the surface worse than as though it were left dry.

Wetordry sandpaper, however, in a little finer grit than this could be dipped in water without any danger of softening the paper, and the backing of this waterproof sandpaper is so flexible that the best of results would ensue. Wetordry is made in grits as fine as No. 8/0 in garnet, and No. 400 in the artifical mineral known as "Tri-M-Ite." While these grits are too fine for practical use, I am mentioning this to indicate the range of fineness in which this sandpaper is obtainable.

I am calling this matter to your attention not to criticize your paper, but because I imagine you will welcome the information here given. The fact that waterproof sandpaper is not generally used in furniture finishing is probably our fault as much as anybodys, and the question of what problems might confront the user of wetordry in this field is something I am not prepared to answer here.

If Mr. Rottmann, or any other

AD-EL-ITE

T.M. REG. U.S. PAT. OFF.

Finishing Service

is ready when you are.

Our demonstrators set the color, lay out shading and decoration, and carry through the finish complete.

Our schedule of demonstrations on suites for the fall and winter Shows is being made now.

Write us for particulars.

Adams & Elting Co.

1833 Seward Street
Chicago, Ill.

"35 years of wood and metal finishing experience"

You'll Like the "Feel"

of a

Handigrip Gun

YOU know from the "feel" of a Handigrip spray gun that it is balanced to relieve the fatigue of continuous painting. The self-aligning nozzle-retainer insures that the nozzles will stay in line in spite of the wear of threads. The spray is instantly controlled by an automatic spring valve.

Cup Gun

These and other distinctive mechanical features of the Handigrip give high quality finish in fine woods and metals, together with the labor-saving advantage of spray-painting. Handigrip handles lacquer, paint, enamel, varnish or wet porcelain. It is easier to clean than a brush. Ideal for frequent changes of color.

Used with a quart cup or with a tank up to 30 gallons capacity; suction, pressure or gravity feed.

Pressure Feed Gun

All items of spray painting equipment, available separately or as complete outfits in small or large sizes.

Positively guaranteed by Plummer-Huff Company Refund Check. You can prove any Handigrip item in your own work without risk.

Write us—kindly address Dept. F.

PLUMMER-HUFF COMPANY

NAPOLEON, OHIO

writer for your paper, would care for samples of our waterproof sandpaper for experimental purposes, we will be very glad to supply them without any expectation that he will in return write us some free advertising. All we care for is to have him know that there is such a sandpaper and what it is capable of doing for the furniture finisher.—W. P. Stewart.*

Preparation of Galvanized Iron

Since galvanized iron and zinc offer such hard and impervious surfaces for finishing, and are apt to be of a greasy nature owing to the methods used in their manufacture, special care must be taken to prepare the surface for the adherence of following coats of paint.

Washing with a cloth moistened in benzine will sometimes be efficacious, but it is better to be safe, and use a solution composed of two ounces of copper sulphate mixed with one half gallon of water. Since this removes some of the surface as well as the grease and oil, care must be taken to apply this mixture thinly, and it must be well spread out.—C. D. Y.

Spraying Airplane "Dope"

On page 10 of your July INDUSTRIAL FINISHING, we find the following statement:

"The pyroxylin found most suitable is that of high viscosity, this giving the most tautening effect per unit weight of film. It must be borne in mind that every ounce of weight that can be saved in airplane construction is of ad-

* Advertising manager of Minnesota Mining & Mfg. Co., St. Paul, Minn.

Spray Hose Couplings

A COMPLETE SERVICE

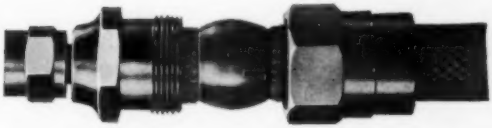
Any size of hose and any size of connection for any make of spray equipment.

DETROIT RUBBER PRODUCTS INC.

Canadian Distributors
WILLIAMS & WILSON, Limited
60-62 West Front St., Toronto, Ont.

Makers of the famous Sphinx Glass Run Channel.

Sales Agents for the Eastman Mfg. Co.



The EASTMAN Way

Put Another String In Your Bow!

Now is the time to fortify yourself with another reliable source of supply for your

Soluble Cotton

Write today for free samples and check them up before the lacquer season gets into full swing.

All Grades
All Viscosities

Nixon Nitration Works
Dept. F. Nixon, N. J.
"Nitrators since 1898"

When writing for samples please state quantities, grades and viscosities desired.

vantage. Since pyroxylin is of high viscosity, only a few ounces can be carried in a gallon of solvent and several coats must be used.

"The material is generally too thick to spray, therefore it is usually brushed on by hand, although it is understood that some makers have managed to get good results by spraying with specially constructed equipment. One bad result of spraying is the raising and stiffening of the cloth fibers, thus giving a rough surface which increases air resistance and friction."

We don't think this statement is in accordance with existing practice and think some further investigation ought to be made along this line.—Wm. J. Pitt, Secretary of Spray Painting & Finishing Equipment Mfrs.' Ass'n.

Note by Author: My understanding is that the general practice in doping airplane fabrics both here and abroad has been by hand brushing. I understand also that some makers of airplanes are spraying the wings but, with my own personal experience as well as reports of others, the results are not quite as satisfactory as those obtained by brushing. As for the wooden and metal parts of the plane, spraying is ideally adapted, and I know is widely used.

If you have any data along the line of this question, I shall be very glad to receive them and add it to a subsequent article. Please understand that both INDUSTRIAL FINISHING and myself are thoroughly in favor of sprayed painting wherever practicable. It is only on such surfaces as fabric and cloth that

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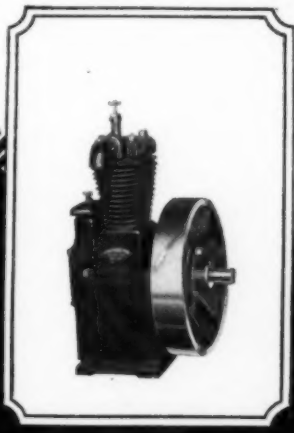

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spraying of lacquers particularly seems to be objectionable, and I do not doubt that a suitable apparatus will some day circumvent even this objection.

Using Wood Fillers

The best paste wood fillers are made of the purest linseed oil, hard-drying filler japan, and inert pigments of the proper type and character. These first-quality materials are combined in the proper proportion to give easy working filler and proper drying qualities. It should be remembered that it is the filler that holds up the finish, and great care should be given to the selection of the proper filler.

The wood filler which is sold for the least money per pound is frequently the most expensive in the long run, due to the large amount of trouble it may cause. After all, the cost of the filler coat on a piece of work is so small compared to the total cost of the article and the difference in price between a first grade filler and a mediocre one is so small, it is really inexpensive insurance to pay a little more and be assured of first quality filler.

Filling Different Woods

No very definite instructions can be given regarding the filling of different woods, as the exact kind of wood will have some bearing upon what will need to be done to get a good film. In general, however, the larger and more open the pores of the wood, the heavier the filler should be when applied. For very fine grain wood it is customary to use 8 or 10-lbs. of filler to a gallon of naphtha, but for the more open-pore woods, such as mahogany, walnut, and especially oak,

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Manufacturers of
WOOD FINISHING MATERIALS

the filler should be reduced at the rate of about 12 to 14-lbs. of paste wood filler to one gallon of naphtha.

A naphtha, suitable for reducing filler, should have a specific gravity of about 0.6560, flash point of about 43-deg. F., boiling point of about 220-deg. F., and end point of about 420-deg. F. It should contain no grease, water, sulphur, or other injurious substances. Nothing but naphtha or turpentine should be added to the filler as received from the manufacturer, for to add oil or other materials to the filler is likely to throw out of balance the proportion of oil, japan and pigments so as to make the filler dry improperly.

The filler should be kept well mixed while it is being used, to prevent the pigment portion from settling to the bottom, and to keep the color uniform. It should be applied thoroughly but not too heavy, brushing it well into the pores. Spraying or dipping of the filler coat does not usually give as good results as brushing.

After the filler is flattened or "ripened" on the work until it is just enough under-wetness to allow it to be rubbed in well and cut off clean, it should be padded into the pores with a good pad made from burlap, hemp or tow, then wipe off the excess filler, using a circular motion to insure each pore being filled. Next, clean off with cloths by wiping first across the grain and finally by wiping lightly with the grain, being careful not to pull any filler out of the pores.

Coloring Fillers

Fillers can be colored, where necessary, with either japan colors or with oil colors, although it is much better to purchase the

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filler ready colored to the desired shade from the manufacturer, so that the color can be thoroughly incorporated with the other ingredients used and be used in the proper proportion with the other ingredients for correct drying and filling properties.

Shellac Over Filler

The use of shellac over filler is optional. It helps to seal the colors in the filler and gives a better body on the work on account of flowing into the low spots. On the other hand, under certain conditions, it will make the finish more brittle than if it were not used. The type of finishing materials being used, and other questions of this sort, must be taken into consideration when deciding whether to use shellac over filler before varnish or lacquer is applied.

In any case, this shellac coat over the filler should not be too heavy, about 2-lbs. of shellac gum to the gallon is about right. This can be made by taking a 4-lb. cut of shellac and mixing it equal parts with denatured alcohol. Where lacquer is to be applied, it is best to let this coat of shellac over the filler dry at least over night before the coat of lacquer is put on. It is not necessary to use shellac over the filler, unless desired, either when using varnish or lacquer, provided the filler is of the proper construction and thoroughly dry.—D. J. Plankman.

In many of the finishing departments of automobile plants the car bodies are sprayed as they pass through specially constructed tunnels. Systems of unit heaters, which blow warmed air, are used as an adjunct to other methods of ventilation.

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"Unquestionable Quality"

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PRODUCTS which have gained recognition through merit.

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"Our own conduct has the loudest tongue," said Cowper—which is only his way of saying that performance is the best standard for judgment.

Accordingly, we choose not to discourse at great length upon the merits of our product. If every man claims that his lacquer is best, it helps us not a whit to mingle our voice with his.

Let ALAKA speak for itself. If past performance is a better criterion for buying lacquers than for picking horses, our product's conduct will make itself heard above any din.

We shall be pleased to send you: 1—A complimentary copy of "Finishing Facts" on request. 2—Any samples of ALAKA you may wish in order that you may test them for performance. 3—If you prefer we will have a representative call to see you.

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INDIANAPOLIS PAINT & COLOR CO.
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Carrying the Color in Your Eye

Under the above heading a writer in this journal recently said: "Regardless of how clever one is at matching colors, it isn't safe to rely upon 'carrying the color in one's eye,' that is, remembering it by sight alone." I believe what he said is quite true—for two reasons. In the first place I have seen many men who thought they could do it, but who discovered they could not when put to the test.

In the second place the appearance of any color is affected by the conditions under which it is viewed. In order to be sure that any two samples of color are the same (provided a man could carry a color in his eye) it would be necessary for him to see them under exactly the same light conditions.

Recently I was in a shop where the foreman finisher recognized both his own and his stainer's inability to "carry colors in the eye." He also recognized the fact that, though the utmost care may be exercised in preparing stains for use, a mistake may occur, and a mistake in preparing stain may be the cause of a great deal of trouble.

This finisher has a rack in the staining room in which are a number of 18x24-in. panels, each finished in a color now in use. Each panel has a number corresponding to the number of the formula from which the stain was made. The formulas are numbered and kept in a book provided for the purpose. Each panel was stained with the first lot of stain that went on regular stock.

Every finisher, who has considerable matching to do, knows how nearly impossible it is to make two pieces of furniture match in

Nu Polish

This Polish is highly endorsed by finishing rooms in large plants for the polishing of

Lacquer on Wood or Metal

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If not as we claim, return it.

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Wood lacquer, Silver and Aluminum lacquer, Bronze lacquer, Brush Brass lacquer and enamels in all colors, glossy and egg shell finishes.

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FIXES
SCRATCHES MARS, HOLES Scarred Finishes

Where finish is damaged, the quickest and easiest way to permanently repair is with

CAMPBELL'S STICK SHELLAC

This is melted in the hole, dent or scratch. The damaged place is then rubbed down and polished. The Shellac will not shrink nor check and is extremely tough. It is indeed the easiest, the quickest, the most economical and only permanently satisfactory method to repair serious injury to any finish

Stick Shellac color card and booklet "How to Repair Varnished Surfaces" *will be sent you free upon request.*

The M. L. CAMPBELL CO.
1007 W. 8th St. Kansas City, Mo.

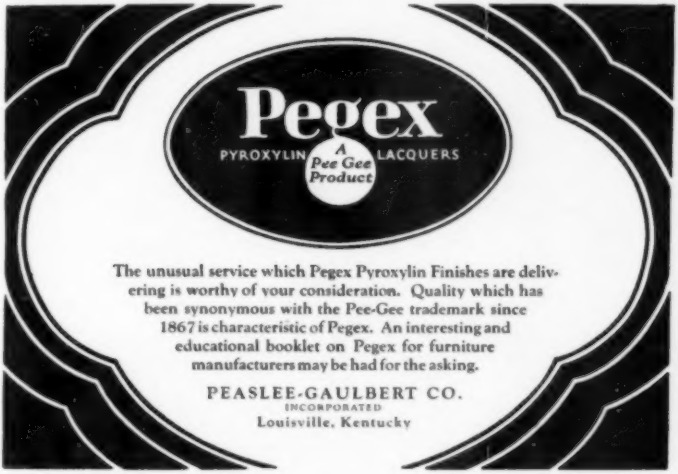
appearance if he has only a small sample of wood to guide him. There is so much difference in woods that no two pieces take stain exactly alike.

If anyone doubts this let him finish a large panel, then cut it into small pieces and mix them up. In a majority of cases there is so much difference between some of the pieces that if one did not know it, he would find it hard to believe that they all belonged to one piece of board and had been stained with the same stain and at the same time. The difference in appearance is caused by a difference in the grain of the various parts of the wood.

Not only is the appearance of a color affected by the conditions under which it is seen; but quite frequently it is affected by the angle from which it is viewed. Take for instance, a panel veneered with four pieces of matched veneer. This kind of work has given the finisher more trouble, perhaps, than has any other single item in finishing, and he hasn't been able to make any perceptible progress toward overcoming it.

Though the four pieces are exactly alike in grain and figure, the grain of each is placed at a different angle from that of the others, and no matter where one stands each piece appears different. The appearance of each piece changes with each change in the angle from which the surface is viewed. With so many factors entering into the appearance of stained wood, it would be folly for a man to contend that he can carry a color in his eye.—W. C. Donnor.

Simplification is a philosophy of management which discourages all unnecessary motions in business.



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Prices as low as

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Your customers depend upon you for a quality paint job. Give them that, with good service, and you'll not need to worry about present profits or future business.

To turn out a smooth, perfect finish, your spray gun needs a steady, unfailing, dry air supply. And for that, *you* can depend upon a Quincy Compressor. Quincys are engineer-designed and built by us, not assembled. Their silent, trouble-free service and long life complete the efficiency of all standard paint spray outfits. Be sure to specify "Quincy" when you order new equipment or replace your present compressor unit.

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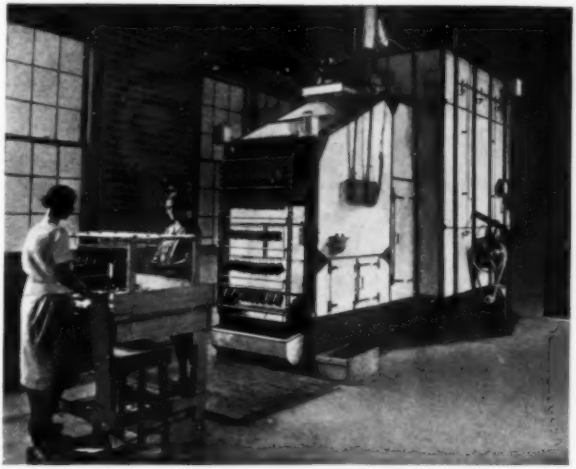
K750

This Section is devoted to the application, baking and polishing of finishes to be dried in ovens.

Baked Finishing



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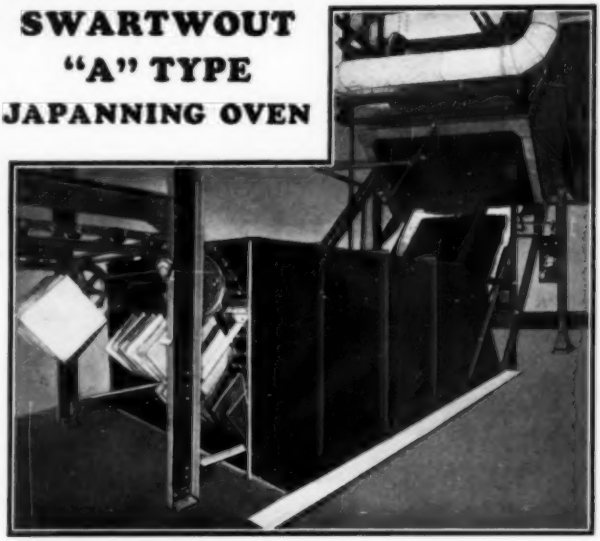

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Swartwout modern construction incorporates

1. Counter airflow — developing maximum heating efficiency with unusually low exhaust stack temperature.
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3. Automatic heat control throughout insures accurate baking with rejects eliminated.

Complete details with recommendations covering adaptation of this or other type baking ovens for your plant, furnished on request.

An order to us means—One Contract—One Responsibility for your complete baking equipment.

THE SWARTWOUT COMPANY, Cleveland, Ohio

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Swartwout

Industrial Ovens

Bake-Finishing Automotive Parts

Calling attention to the importance of baked finishes, particularly in the automotive industry, and describing the metal cleaning, conveying, finishing and baking equipment employed in a representative motor products plant

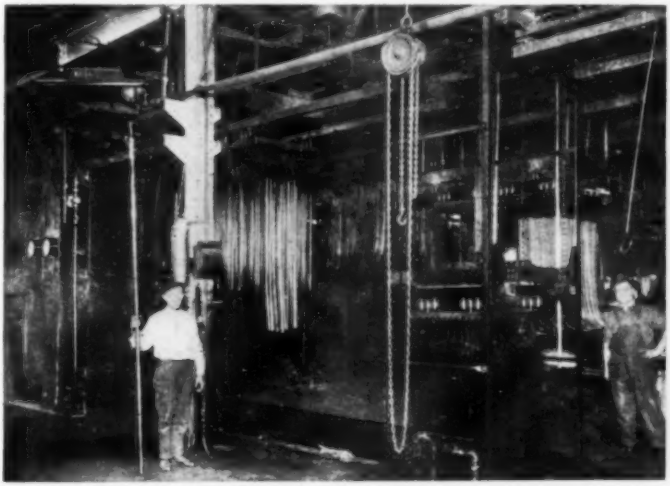
By J. B. Nealey

THE AUTOMOBILE has probably done more to advance the metal finishing industry than any other one factor. The automobile manufacturer, in trying to satisfy the demand for increasingly better cars, requires every type of finish known, and is constantly at work to devise novel finishes or to decrease the cost of standard finishes.

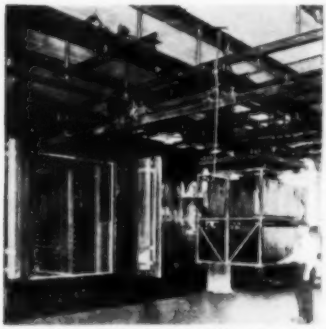
The old art of japanning has practically been revolutionized as is evidenced by the work which passes through any of the larger plants engaged in this business today.

One of the leaders in this work is the Motor Products Corp., of Detroit, which specializes in contract work for the automotive industry. A vast multitude of parts, ranging from Ford oil tubes to Packard window frames, is constantly flowing through this enormous plant.

The extremely large variety of coating materials required in the production of these thousands of parts, large and small, has introduced a great many problems. New methods or revised and improved equipment are the only



In the japanning room—dip tanks, overhead carriers and ovens.



At left, the open doors to baking oven, and, at right, a load about to enter by overhead carrier.

means by which these problems could ever have been solved.

Black Enamel and Japan

Consider some of the features of the department handling solid colors, usually black enamel. Here are finished, such articles as snap-on molding, body slip cleats, and others used in the manufacture of the less expensive cars.

The article to be finished is suspended by a fine wire from the carrier or rack, which travels on over-head tracks. These carriers are provided with a number of cross bars on which are hung the hooks for the wire holders. Each rack has a capacity of between 180 and 456 strips of molding, depending on the design of the strips. These are loaded, unloaded, and transferred by two girls.

A rack, having been loaded, is first run through a washing vat, then into a rinsing vat and then the work is dried. The japan or enamel is applied usually by dipping, after which the rack, with its load, goes into the baking oven. Additional coats of finish are put on in the same way, care being taken not to have the load exposed to factory dust during cooling between bakes.

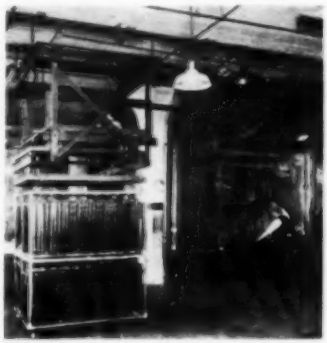
The over-head trolley system is modern in every respect, with through tracks, transfer panels and switches, which makes it easy and convenient to take a rack out of the line of production, or reroute it at will.

The cleaning solution is specially prepared and maintained at a temperature of about 212-deg. F. Both the dipping tank and the rinsing tank are about three feet square and ten feet deep, with the fluid surface at about floor level. They are both steam-heated.

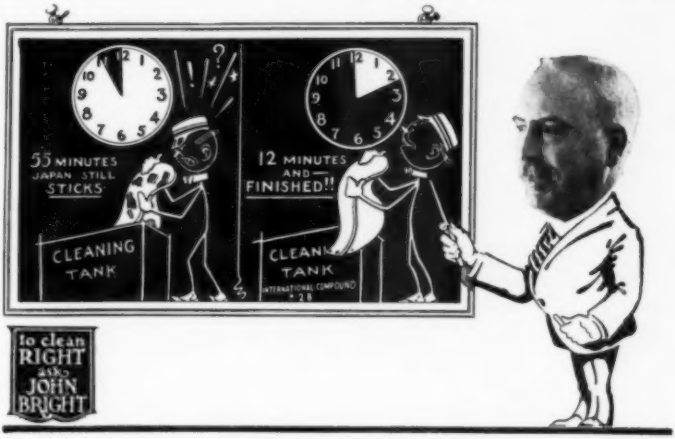
A carrier loaded with molding coming out of the rinsing tank dries very quickly, due to the heat absorbed by the metal while in the tank. Very thin moldings, or parts having very little metal content, are run into a drying oven after rinsing in order to speed up this operation. All parts are thoroughly dried before going into the japan tank.

Oven Equipment

There are five modern ovens in two batteries—three in one, and



Showing, at left, a load ready to enter oven, and at right a load entering the oven.



Strip Japan in Minutes Instead of Hours

Excuse the picture. I drew it myself. What I am trying to illustrate is that INTERNATIONAL No. 2B is the fastest all around japan, enamel and paint stripper I have ever met in my 27 years' experience.

Above is an illustration of how No. 2B led the second best stripper in a competitive test. Now No. 2B won't remove every japan in 12 minutes. But it WILL strip any kind of japan much more quickly than most anything you can find.

Would you like to try it?

Internationally yours
John Bright

INTERNATIONAL CHEMICAL CO
PHILADELPHIA ----- PENNA

two in the other—that serve this department. These are two-compartment, indirect gas-fired ovens, equipped with mechanical ventilation and automatic temperature control. Fresh air is fed from the rear of the oven. An independently-piped pilot flame insures immediate ignition in case the flow of the main gas line is temporarily broken. The baking time varies, of course, with the type of work and finish, but ordinarily it runs about 45 minutes at 450-deg. F.

In addition to these ovens we find one of the continuous conveyor-type ovens, designed for mechanical ventilation and operating from a remote oil heater. The baking period and temperature for this oven is the same as for the two batteries of rack-type ovens previously mentioned. Practically all types of sheet metal parts are being baked in this continuous-conveyor type oven.

Wood Grain Reproduction and Bake-Finishing on Metal

Explaining the wood-grain reproduction and bake-finishing process of finishing certain automotive parts in a modern motor-products plant in Detroit

By N. J. Bartlett

WOOD GRAINING on metal has reached a state of perfection that is truly remarkable. The likeness to a highly polished wood surface is so exact that even an expert could not tell the difference without a mechanical test. Wood graining, unlike black japanning, requires a great deal of expert hand work, and it is very hard indeed to keep the ranks of experienced operators recruited. Both men and women are to be found handling this type of work.

The wood-graining process in the finishing department of the Motor Products Corp. at Detroit, consists first of placing a flat ground coat on the article. On this is superimposed the graining coat, and on top of that from one to five varnish coats.

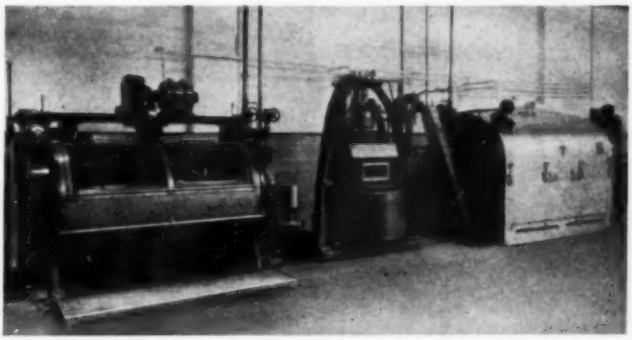
Spraying Ground Coat

The ground coat is applied by means of a spray gun operating under 100-lbs. air pressure. Originally it was attempted to apply this coat by the dipping method, but it was found that dipping was sure to cause runs and other imperfections, which could not be economically rectified in the later stages of the process.

Air pressure at the guns is maintained uniform in order to secure the best results. This is accomplished by an auxiliary air reservoir or receiver at each booth.

The spraying is done in a standard spray booth equipped

In this compact "American" Unit, wiping rags and all other washable materials are washed, dried and returned to service promptly—soft, dry and thoroughly clean. Write for particulars.



Wash those rags—
use them over and over again!

HUNDREDS of leading plants everywhere have discovered the profitable advantages of using the "American" Unit for reclaiming wiping rags and cloths.

For with this money-making equipment in your plant, you can wash those rags over and over again—as many as eight or ten times. A big saving—a wallop at wiping expense.

Have us send you the facts—tell you where you can see this modern equipment in operation. Or, better still, have an "American" representative come into your plant and make a study of the conditions. No obligation whatever—and he'll show you the way to some real savings. Write today.

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Specialty Department U, Cincinnati, Ohio

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Get acquainted with the products that will give you 100% better finishings.

French's Crown White Enamel
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Let us develop an Enamel to suit your particular needs.

Before making any decision on your finishing problems, by all means send for information on any or all of the above products.

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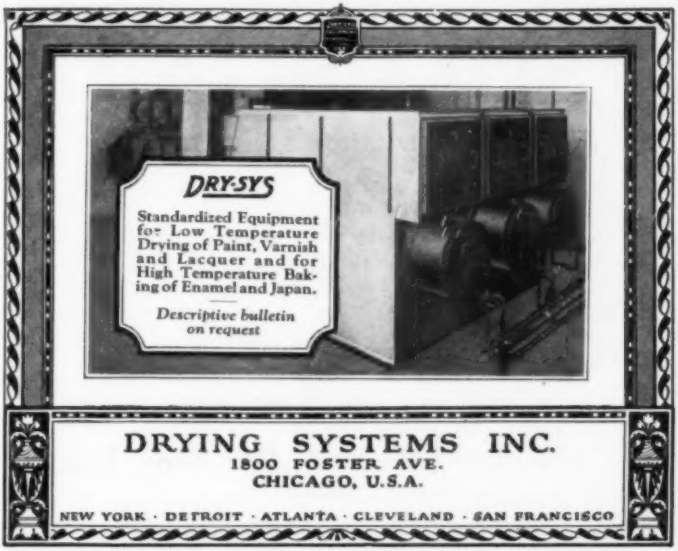
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hand sanding. It is sometimes advisable to use a plain block of wood around which to wrap the sandpaper, to prevent having more pressure with the fingers on certain parts of the surface than on others and thus producing ridges and other defects.

All of the sawdust, sandpaper, grit and similar substances must be thoroughly removed from pores of the wood before the finishing operation starts, if good results are to be secured. This can be done by using a stiff bristle brush followed by blowing off with compressed air.—A. B. C.

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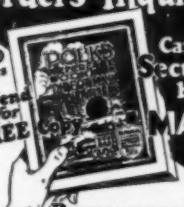

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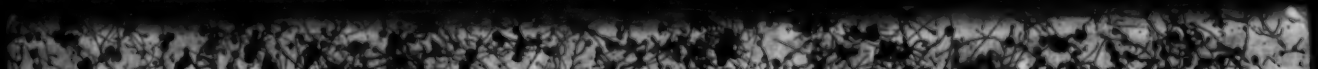
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